SAMSUNG CFG-9637

MODEL

SERVICE MANUAL

SPECIFICATION

Classification	Specifications
Picture Tube	20" (19V) Full Square, Flat Face, 90° deflection, 0.28 mm Dot Pitch, Silica-coated with anti-electrostatic, Medium short persistence phosphor.
Scanning Frequency Horizontal Vertical	 30 kHz to 82 kHz (Automatic). 50 Hz to 120 Hz (Automatic).
Display Colors Analog Input	 Unlimited Colors.
Maximum Resolution Horizontal x Vertical	 1280 Dots x 1024 Lines.
Input Video Signal	Analog 0.714 Vp-p positive at 75Ω terminated.
Input Sync Signal	Separate Sync : TTL level positive/negative. Composite Sync : TTL level positive/negative. Sync on green : Composite sync 0.286 Vp-p negative, Video 0.714 Vp-p positive.
Video Band Width (Pixel Time)	150 MHz.
Power Supply Power consumption	AC 100-120/220-240 Volt, 60/50 Hz ±3 Hz . 130 Watt (MAX).
Active Display	Horizontal : 340 mm ±3 mm (5:4 ratio), 360 mm ±3 mm (4:3 ratio). Vertical : 270 mm ±3 mm. * Active display area is changed by signal timing.
Dimension Unit (HxWxD) Carton (HxWxD)	 19.3 x 19.9 x 20.1 inches (490 x 505 x 510 mm). 24.7 x 25.0 x 25.3 inches (627 x 633 x 642 mm).
Weight Approximately Net Gross	 63.9 Lbs (29 Kg). 72.8 Lbs (33 Kg).
Environmental Considerations Operating Temperature Humidity Storage Temperature Humidity	 32° F to 104° F (0° C to 40° C). 10 % to 80 %. -4° F to 113° F (-20° C to 45° C). 5 % to 95 %.
MPRII compliance	This model complies with SWEDAC (MPRII) recommendations for reduced electric and magnetic fields.

NOTE : DESIGNS and SPECIFICATIONS are subjected to change without prior NOTICE.

SAFETY PRECAUTIONS

Service work should be performed only by qualified service technicians who are thoroughly familiar with all of the following safety checks and servicing guidelines:

1. Warning

1) For continued safety, do not attempt to modify the circuit.
2) Disconnect the AC power before servicing.
3) Semiconductor heat sinks are potential shock hazards when the chassis is operating.

2. Servicing the High Voltage System and Picture Tube

When servicing the high voltage system, remove the static charge by connecting a 10 kohm resistor in series with an insulated wire (such as a test probe) between the chassis and the anode lead. (The AC line cord should be disconnected from the AC outlet.)

1) The picture tube in this display monitor employs integral implosion protection.
2) Replace with a tube of the same type and number for continued safety.
3) Do not lift the picture tube by the neck.
4) Handle the picture tube only when wearing shatterproof goggles and after discharging the high voltage anode completely.

3. X-Radiation and High Voltage Limits

1) Be sure all service personnel are aware of the procedures and instructions covering X-radiation. The only potential source of X-ray in a current solid state display monitor is the tube. However, the picture tube does not emit measurable X-ray radiation if the high voltage is as specified in the "high voltage check" instruction. It is only when high voltage is excessive that X-radiation is capable of penetrating the shell of the picture tube, including the lead in glass material.The important precaution is to keep the high voltage below the maximum level specified.

2) It is essential that serviceman have available at all times an accurate high voltage meter. The calibration of this meter should be checked periodically.

3) High voltage should always be kept at the rated value no higher. Operation at high voltages may cause a failure of the picture tube or high voltage circuitry and, also under certain conditions, may produce radiation in excess of desirable levels.

4) When the high voltage regulator is operating properly, there is no possibility of an X-radiation problem. Every time a color chassis is serviced, the brightness should be tested while monitoring the high voltage with a meter to be certain that the high voltage does not exceed the specified, value and that it is regulating correctly.

5) Do not use a picture tube other than that specified, or make un recommended circuit modifications to the high voltage circuitry.

6) When troubleshooting or taking test measurements on a display monitor with excessively high voltage, avoid being unnecessarily close to the display monitor. Do not operate the display monitor longer than is necessary to locate the cause of excessive voltage.

4. Fire and Shock Hazard

Before returning the display monitor to the user, do the following safety checks:

1) Inspect all lead dress to be certain that the leads are not pinched or that hardware is not lodged between the chassis and other metal parts in the display monitor.

2) Inspect all protective devices such as nonmetallic control knobs, insulating materials, cabinet backs, adjustment and compartment covers or shields, isolation resistor-capacitor networks, mechanical insulators, etc.

3) To be sure that no shock hazard exists, check for leakage current in the following manner:

① Plug the AC line cord directly into an AC 100-120/22-240 volt outlet. (Do not use an isolation transformer for this test)
② Using two clips leads, connect 1.5 kohm, 10 watt resistor paralleled by a 0.15 uF capacitor in series with all exposed metal cabinet parts and a known earth ground, such as electrical conduct or electrical ground connected to earth ground.
③ Use a SSVM or VOM with 1000 ohms per-volt or higher sensitivity to measure the AC voltage drop across the resistor. (See Figure 1.)

④ Connect the resistor to all exposed metal parts having a return path to the chassis (metal cabinet, screw heads, knobs and shafts, escutcheon, etc.) and measure the AC voltage drop across the resistor.

⑤ Any reading of 5.25 volt RMS (this corresponds to 3.5 milliampere AC) or more is excessive and indicates a potential shock hazard which must be corrected before returning the display monitor to the user.

5. Product Safety Notices

Some electrical and mechanical parts have special safety-related characteristics which are often not evident from visual inspection, nor can the protection they give necessarily be obtained by replacing them with components rated for higher voltage, wattage, etc. Parts that have special safety characteristics are identified by ⚠ on schematics and parts lists. Use of a substitute replacement that does not have the same safety characteristics as the recommended replacement part might create shock, fire and/or other hazards. Product safety is under review continuously and new instructions are issued whenever appropriate.

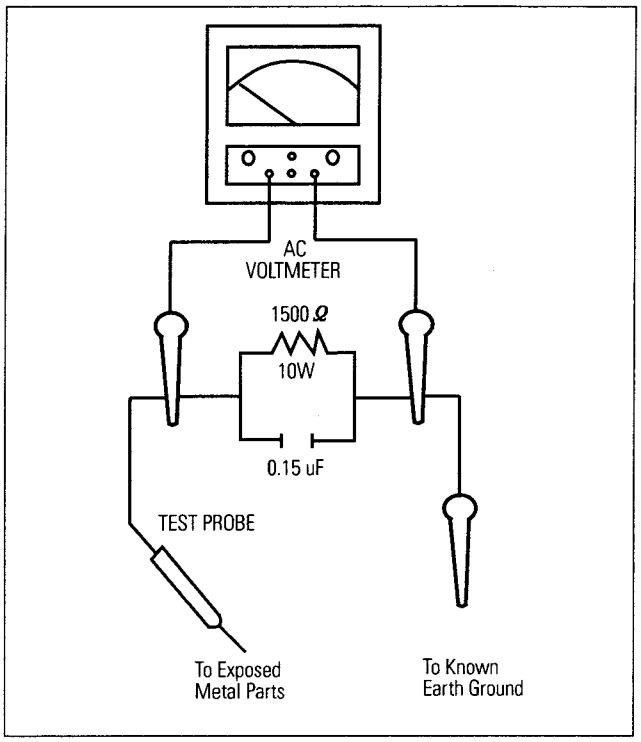


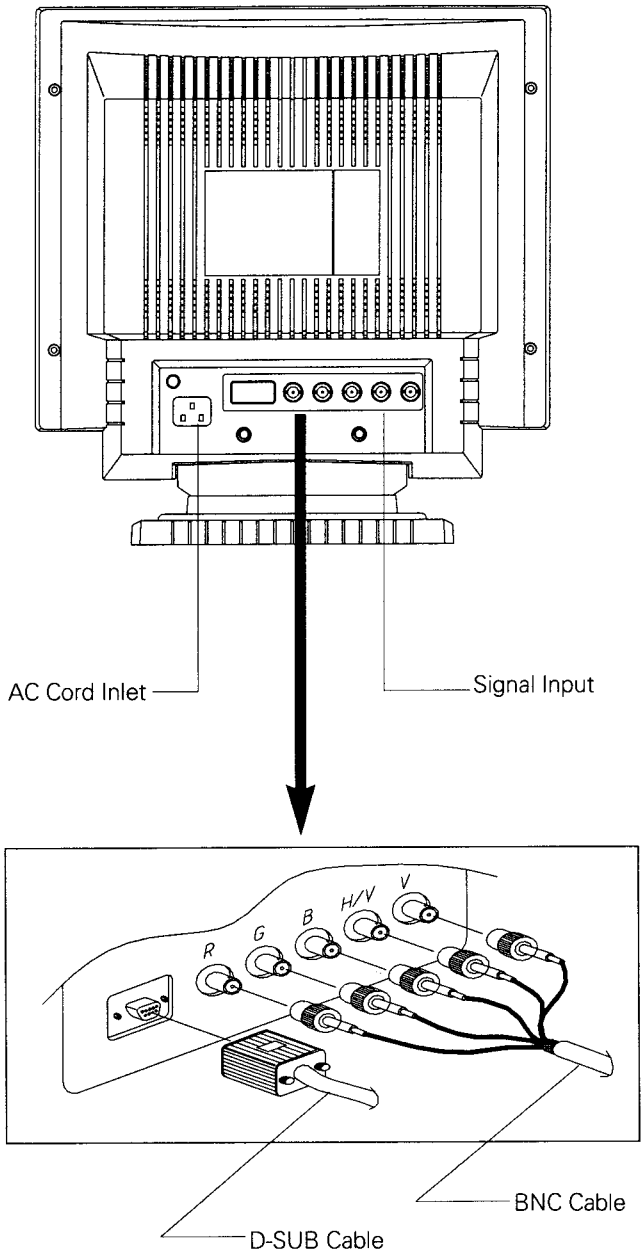
Figure1. Leakage Current Test Circuit

GENERAL INFORMATION

1. Features

1) 20-inch (19-inch visual) Square Technology CRT reduces glare and enhances viewing area.
   - 0.28 mm Dot Pitch.
2) Anti-static CRT coating eliminates static electric shock and helps keep the screen dirt free.
3) Dynamic focusing provides optimum clarity in all areas of the display.
4) Automatically scans horizontal frequencies from 30-82 kHz, and vertical frequencies from 50-120 Hz.
5) Compatible with a wide variety of video standards including VGA, super-VGA, IBM XGA, XGAII, MacintoshII, IBM 8514/A, 1024x768 non-interlaced, and 1280 x 1024 non-interlaced.
6) With the optional cable adapter this monitor is compatible with the MacintoshII family, the Macintosh LC/LCII and QUADRA series.
7) Supports VESA flicker-free modes.
8) Microprocessor based digital control system saves up to 11 user definable display settings. Also includes 12 factory preset display settings.
9) This model complies with SWEDAC(MPRII) recommendations for reduced electric and magnetic fields.
10) Power supply operates on AC 100-120/220-240 Volt 60/50 Hz for use all over the world.
11) Dual signal inputs allow connection to two video sources, VGA(D-Sub) and 1280x1024(BNC), for example, and either can be selected with a front panel switch.
12) Your display has been designed to operate on all power systems, including "IT" power systems.
13) Power management system:
    The power management circuit, when signaled by the computer system, will reduce power consumption when the computer system is not in use.
14) Optional Feature
    Please consult your dealer for information about these optional features. Apple Macintosh connector adapter are available for connecting the monitor to the Apple Macintosh family, Macintosh LC/LCII/LCIII, Centris, and Quadra series computer.

2. Installation



This monitor can be connected to any IBM compatible analog display adapter. Such adapters include VGA, 8514/A, XGA, and the built-in video system of IBM PS/2 computers and compatibles. Also, this monitor can be connected to a high resolution (1280 x 1024) video controller, such as those used with CAD/CAM applications. Both connections can be used separately or simultaneously. Selection between the two signal sources is controlled by a front panel switch.

To attach the monitor to your system, use the following instructions:

1) Turn off the power to the computer.

2) Connect video signal cable to the D-sub or the BNC connectors on the rear of the monitor.

   Note : Two signal sources can be connected to the monitor at the same time. In this case use both connections, D-sub and BNC. The front panel switch selects source input.

3) Connect video signal cable to the video port of the computer's controller.

4) Insert AC power cord into the monitor and then into an AC power outlet.

5) Before turning on the power to the monitor and computer, check your computer's owner's manual for instructions about turning on equipment connected to the computer. Also, check for any instructions for your video system when using a multi-sync monitor. In some cases, jumper or switch settings may be required for the video board to output extended resolution modes.

6) To turn on the monitor, push the power switch. The power indicator LED will light. To turn the monitor off, push the power switch again. The power indicator LED will also turn off.

3. Connection to your computer (MacintoshII Family)

With the cable adapter, this monitor is compatible with Apple MacintoshII Family, Macintosh LC/LCII /LCIII, Centris, and Quadra series computers. (Please see Page 3-7 for the pin assignments.)

To attach the monitor to your system, follow these instructions:

1) Turn off the power to the monitor and computer.

2) Connect the cable adapter to the video output port of your video controller. Tighten the screws on the cable adapter.

3) Connect the 9-pin side of the signal cable to the 9-pin D-sub connector on the rear side of the monitor.

4) Connect the 15-pin side of the signal cable to the other end of the cable adapter. Tighten the screws of the signal cable to ensure proper connection.

5) Connect one end of the power cable to the monitor and the other end to the power outlet.

6) Turn on the monitor and the computer.

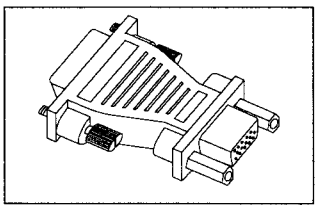


Figure 1. Cable Adapter

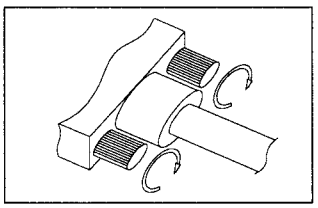


Figure 2. Screw of the signal calbe

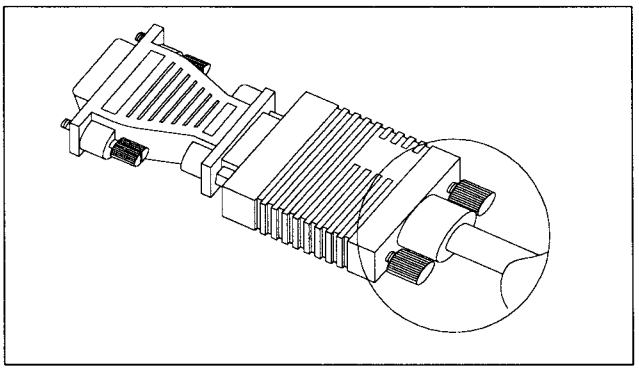
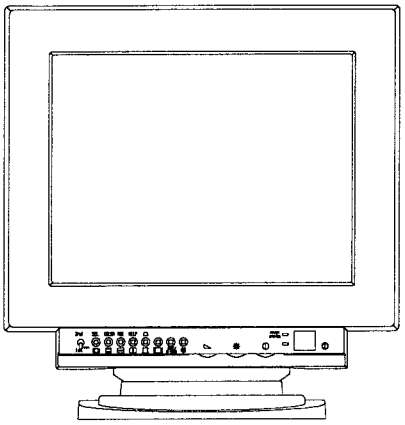
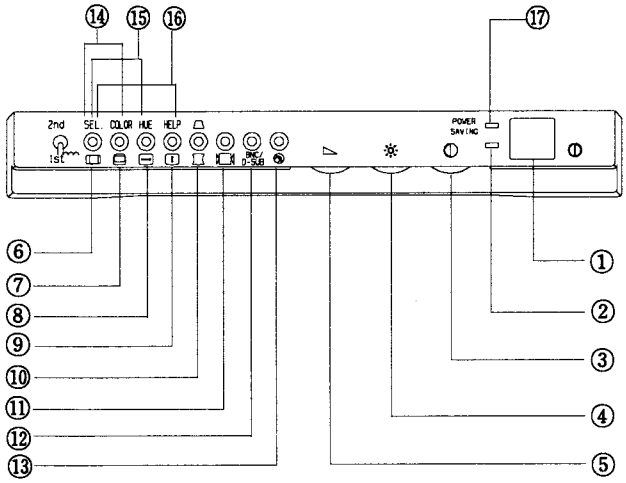


Figure 3. Cable Adapter installing diagram

4. Control Location & Functions

4-1. Front View





1	Power Switch
2	Power Indicator (Dual Color)
3	Contrast
4	Brightness
5	Variable
6	Horizontal Position / Select
7	Vertical Position / Color
8	Horizontal Size / Hue
9	Vertical Size / Help
10	Side Pincushion / Trapezoid
11	Recall
12	BNC / D-Sub
13	Degauss
14	Parallelogram
15	Vertical Linearity
16	Pin Balance
17	Power Saving Indicator

4-2. Basic Controls and LED Indicator Functions

1) Power Switch:

Use to switch monitor power on and off. Push the power switch once to turn monitor power on. The indicator LED glow green. Push the switch again to turn monitor power off.

2) Power Indicator (Dual color):

Green/ Orange

When the monitor is powered on, and no adjustments are being made, the indicator LED glows green. When an adjustment function is selected the indicator LED glows orange.

3) Contrast Control:

Use to adjust the contrast level of the displayed image. Contrast controls the difference between dark and light areas of the displayed image.

4) Brightness Control:

Use to adjust the overall brightness of the displayed image.

The Display Adjustment

Use the Variable adjustment control to adjust the displayed image when a control function is enabled (the indicator's color is orange).
Note : After completing an adjustment the indicator LED will return to short green after 3-4 seconds showing that your adjustment has been saved. The OSD will remain on for about 10 seconds.

5) Variable Adjustment Control:

Turn the Variable adjustment control counterclockwise to decrease the value of the adjustment function. Turn the Adjustment control clockwise to increase the value of adjustment function.

Microprocessor Controls & Functions

General Description

The monitor has preset display settings for each of the standard signal timing listed on the timing chart. In other words, the monitor will automatically adjust itself to an optimum size and position when it senses one of the standard signal timing. However, some users wish to adjust the monitor to their preferred setting rather than the factory preset. The microprocessor controlled adjustments will automatically memorize the display settings that you prefer for a specific signal timings and automatically adjust itself when the monitor senses that signal. Up to 11 different timing/settings can be saved. See Page 5-1, 5-2, for the standard Signal timing chart.

Control Function Buttons

This monitor incorporates single and multi-function buttons. Single function buttons, when pressed, allow access to one of the control functions. Multi-function buttons can access a second function in addition to the first function. To access the second adjustment function, push the function button twice. Refer to this chart of multi-function buttons that allow access to a second function.

Button No.	PUSH	
	ONCE	TWICE
6	Horizontal Position	Color Select
7	Vertical Position	Color
8	Horizontal Size	Hue
9	Vertical Size	Help
10	Side Pincushion	Trapezoid

On Screen Display

This monitor features an On Screen Display (OSD) that shows information about the display settings to the user. The OSD will appear on the screen when a function button is selected. The OSD will show the name, range, and current setting of that control function. In addition, the OSD will show the current input signal frequency, and the list of factory and user preset timing. The OSD will remain activated approximately 10 seconds after any adjustments are completed.

6) Horizontal Position / Color Select:

First function : Horizontal Position
Press this button once to adjust the horizontal position (centering) of the display.
Use the Variable adjustment control to adjust.

Second function : Color select
Press this button twice to access the color select function. When the function is enabled, the OSD will show " [F] -- [1] -- [2] ".
[F] is the "Factory preset" color [1] and [2] are two addresses that the user can adjust color and then save.
The initial value of [1], [2] is equal to [F]. If you want to change the factory preset color, turn the Variable adjustment control to select user address [1] or [2].
The new color address is automatically saved in two or three seconds. Then select control functions button for "color" and "Hue" and adjust each with the variable adjustment control until the desired color is displayed. Please see the following descriptions for control functions "Color" and "Hue".

Note : It is helpful to refer to a color diagram before making color adjustments. (Please refer to following page)

7) Vertical Position / Color Saturation:

First Function : Vertical Position
Press this button once to adjust the vertical position (centering) of the display.
Use the Variable adjustment control to adjust.

Second Function : Color saturation
Press this button twice to access the color saturation. Saturation (radius) is the distance away from the reference white value (preset at factory not a user control) in the direction of a primary color or color combination. Increasing saturation(radius) results in changing the color away from white and towards vivid concentrations of a color(hue).

8) Horizontal Size / Hue:

First Function : Horizontal Size
Press this button once to adjust the horizontal size (width) of the display. Use the variable adjustment control to adjust.

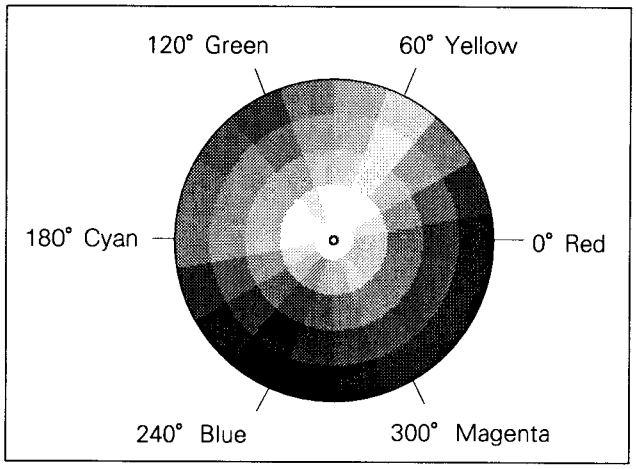
Second Function : Hue

Press this button twice to access the hue function. Hue (angle) is the term used to define color. Adjusting the hue (angle) determines the color that will displayed. By adjusting the hue(angle) the color can be changed from blue to bluish-green to green and so on. Turn the variable adjustment control to the desired color (hue).

Note : If the color saturation is not increased to a sufficient level, then hue adjustments may not be visible. Please make sure that color saturation is increased in order to see your hue adjustments.

REFERENCE

Color Map



What is the Hue ?
Hue, the property associated with color family, (i.e. red, yellow, purple, etc.) is specified as an angle and ranges from 0° to 359°, with red at 0°, by convention.

What is the Saturation ?
Saturation describes the vividness of color or its variation from white to the most vibrant Hue (100).

9) Vertical Size / Help:

First Function : Vertical Size

Press this button once to adjust the vertical size(height) of the display. Use the Variable adjustment control to adjust.

Second Function : Help

Press this button twice to access the help function. The OSD will show the contents of the factory preset timing modes and user modes. Use the Variable adjustment control to "page" through the list.

Note: Don't push this button longer than 7 seconds continuously. If then, this operation resets all of the data in the user memory area.

10) Side Pincushion / Trapezoid:

First Function : Side Pincushion

Press this button once to adjust the vertical sides of the display from bowing in(pincushion) or bowing out (barrel distortion.) Turn the variable adjustment control until the vertical sides are straight.

Second Function : Trapezoid

Press this button twice to access the trapezoid distortion function. Use the variable adjustment control to correct any trapezoid (keystone-like) distortion of the display.

11) Recall:

Use this button to recall factory preset settings. When the recall button is pushed, the indicator LED will change color from green to orange (the same as any other function) and the OSD will appear.

Keep pressing the recall button for 2-3 seconds until the indicator LED's color is changed to green which indicates that the factory settings for that timing have been recalled. The OSD will show the progress of the recall function.

Note: This operation resets all of the data in the user memory area for the current signal timing.

About burn-in mode : You can operate or disable power saving function if you need. In no signal state (video cable is disconnected from this monitor), the indicator's color is orange. Push horizontal position button before monitor run into power saving mode, the power saving function is disabled and then you can warm up this monitor. This burn-in mode is removed when the power of monitor is off and on again.

12) BNC / D-SUB:

BNC/ D-SUB

Use this button to select signal sources connected to the BNC and D-sub connector inputs. An active signal(horizontal and vertical sync) must be connected to both inputs in order to use this switch function.

13. Degauss:

Magnetic fields can build up on the CRT and cause color impurity. Use the DEGAUSS button to demagnetize the CRT. Push the button once to activate the degaussing circuit. The degaussing circuit automatically turns itself off after a few seconds.

14) Parallelogram:

To activate the parallelogram adjustment function press "the Horizontal position/ Color Select" button and "the Vertical position/ Color" button simultaneously for 4-5 seconds.

15) Vertical Linearity:

To activate the vertical linearity adjustment function press the "Horizontal Position / Color Select" button and the "Horizontal Size/ Hue" button simultaneously for 4-5 seconds.

16) Pin Balance:

To activate the pin balance adjustment function press the "Horizontal Position/Color Selet" button and the "Vertical Size/Help" button simultaneously for 9-10 seconds.

5. Option Power Management Circuit (Power Saving Function)

If your computer system features a display power management function, this monitor, when signaled, will enter power saving modes. The purpose of power management is to automatically reduce power consumption when the computer system is not in use. This monitor can enter 3 different power saving modes as described below.

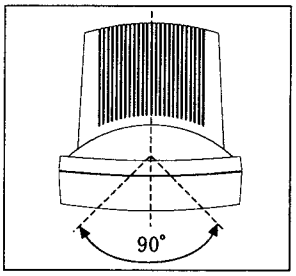
Table: Display Power Management Signaling (DPMS) Standard

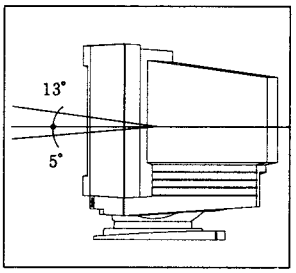
State / Sync	Normal Operation	Power Saving Function Mode		
		Stand-by mode	Suspend mode	Power-Off mode
Horizontal Vertical Video	Active Active Active	Inactive Active Blanked	Active Inactive Blanked	Inactive Inactive Blanked
Remark (LED Color)	Green	Orange	Orange/Green Blinking (0.5 Sec interval)	Orange Blinking (1 Sec interval)
Power Consumption	130 W (Max)	110 W (Max)	Less than 30 W	Less than 8 W

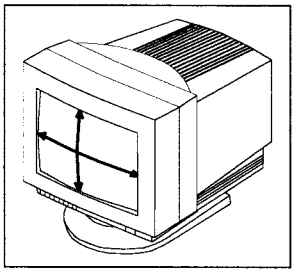
Note: This monitor automatically returns to normal operation state when horizontal and vertical sync rare detected.
When you turn power off in power-off mode, LED indicator may continuously blink on-off about for 4 to 5 seconds.

6. Use of the tilt-swivel

With the tilt-swivel, this unit can be adjusted to be viewed at your desired angle within 90° will the swivel and 18° with the tilt.
To turn the unit horizontally, hold it at its bottom with your both hands as illustrated below.







7. Signal Connections and Pin Assignments

1) BNC Connectors

BNC connectors are used with coaxial cable for improved signal transmission. Improved signal transmission becomes critical at high frequencies such as those required for 1280x1024 resolution. Most video boards that operate at 1280x1024 resolution recommend using coaxial cable with BNC connectors. The 5 BNC connectors on the rear of the monitor can accept Red, Green, and Blue video. Composite sync can be applied separately, or combined with the Green video signal (commonly referred to as "composite sync on green"). If composite sync on green is used, then only 3 of the 5 BNC connectors are used. The connectors are labeled accordingly.

BNC Signal Input (Type: Figure 1)

Pin Assignment	Signals		
	Sync on Grgeen	Composite H/V	Separate H/V
1	Red	Red	Red
2	Green+Sync	Green	Green
3	Blue	Blue	Blue
4	Not Used	H/V Sync	Horizontal Sync
5	Not Used	Not Used	Vertical Sync

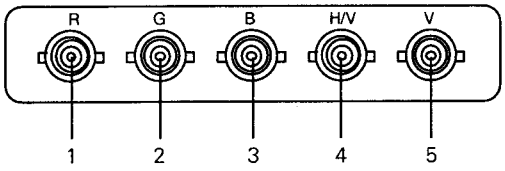


Figure 1

2) D-SUB Connectors

Sync Type / Pin No.	9 Pin Side of the Signal Cable (Figure 2)			15 Pin Side of the Signal Cable (Figure 3)			Cable Adapter (Figure 4)
	Separate H/V	Composite H/V	Sync on green	Separate H/V	Composite H/V	Sync on green	Apple MACII
1	Red	Red	Red	Red	Red	Red	Gnd Red
2	Green	Green	Green+Sync	Green	Green	Green+H/VSync	Red
3	Blue	Blue	Blue	Blue	Blue	Blue	H/V-Sync
4	H-Sync	H/V-Sync	Not Used	Gnd	Gnd	Gnd	Sense 0
5	V-Sync	Not Used	Not Used	NC	NC	NC	Green
6	Gnd-Red	Gnd Red	Gnd Red	Gnd Red	Gnd Red	Gnd Red	Gnd-Green
7	Gnd-Green	Gnd Green	Gnd Green	Gnd Green	Gnd Green	Gnd Green	Sense 1
8	Gnd-Blue	Gnd Blue	Gnd Blue	Gnd Blue	Gnd Blue	Gnd Blue	Reserved
9	Gnd-Sync	Gnd Sync	Gnd Sync	NC	NC	NC	Blue
10	-	-	-	Gnd-Sync	Gnd-Sync	Gnd-Sync	Sense 2
11	-	-	-	Gnd	Gnd	Gnd	Gnd
12	-	-	-	NC	NC	NC	Vertical Sync
13	-	-	-	Horizontal Sync	H/V-Sync	Not Used	Gnd-Blue
14	-	-	-	Vertical Sync	Not Used	Not Used	Gnd
15	-	-	-	NC	NC	NC	Horizontal Sync

Note: "NC" means no connection.

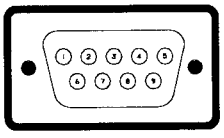


Figure 2: Male Type

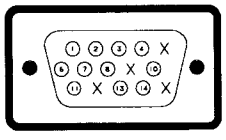


Figure 3: Male Type

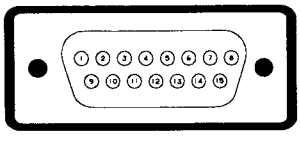


Figure 4 : Male Type

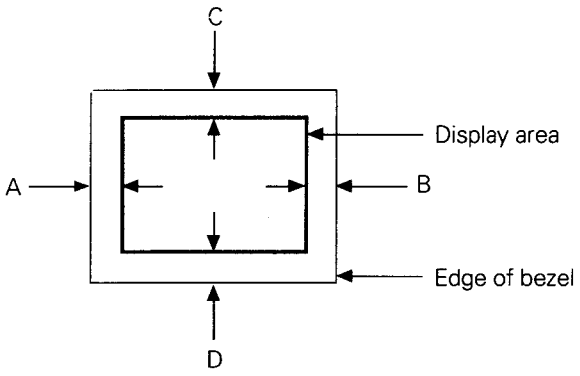
DISPLAY PERFORMANCE

1. Display Area

1) Width : 340 ±3 mm (5:4 ratio).
360 ±3 mm (4:3 ratio).
2) Height : 270 ±3 mm.

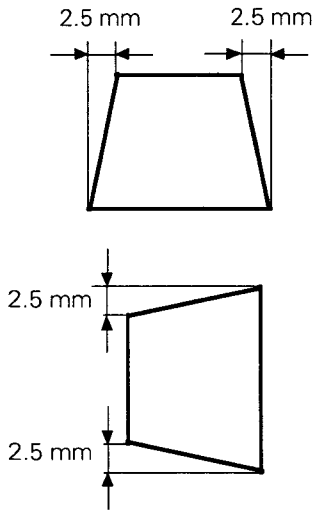
2. Centering

| A - B | ≤ 6.0 mm.
| C - D | ≤ 6.0 mm.

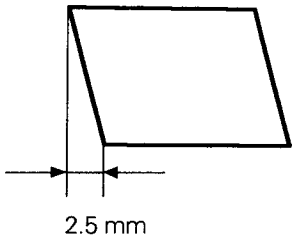


3. Distortion

1) Trapezoid

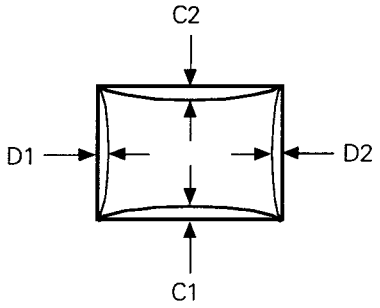


2) Parallelogram



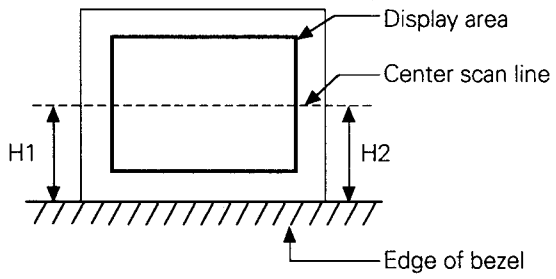
3) Pincushion

| C1 |, | C2 | ≤ 2.5 mm.
| D1 |, | D2 | ≤ 2.5 mm.



4) Rotation

| H1 - H2 | ≤ 2.0 mm.



DISPLAY PERFORMANCE

4. Linearity

1) Standard Mode : 77kHz/72 Hz, 56 kHz/70 Hz.

Horizontal Linearity (HL) :

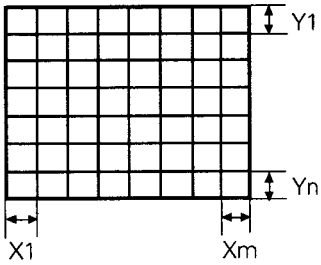
$$\frac{Xmax - \bar{X}}{\bar{X}} \times 100 \text{ or } \frac{\bar{X} - Xmin}{\bar{X}} \times 100 \leq 5\%$$

Vertical Linearity (VL) :

$$\frac{Ymax - \bar{Y}}{\bar{Y}} \times 100 \text{ or } \frac{\bar{Y} - Ymin}{\bar{Y}} \times 100 \leq 5\%$$

2) Other Modes

HL, VL ≤ 7% for Other Mode : VGA, XGA2, 37kHz, 48kHz, XGAII, 64kHz.



m=16
n=12

3) Conditions

Display image : Crosshatch pattern
Maximum and minimum values should not be adjacent to each other.

Xmax is maximum value among X1 ~ Xm
Xmin is minimum value among X1 ~ Xm

$$\bar{X} = \frac{X1 + X2 ..... Xm}{m} \quad (m=16)$$

Ymax is maximum value among Y1 ~ Yn
Ymin is minimum value among X1 ~ Yn

$$\bar{Y} = \frac{Y1 + Y2 ..... Yn}{n} \quad (n=12)$$

5. Brightness Uniformity

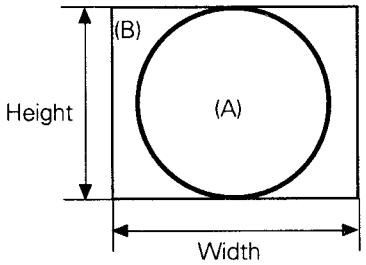
Value	70% (Min) Variation = $\frac{C}{A} \times 100$
Conditions	Display Image : White flat field Luminance : 20 F/L at the center of display area A : Luminance at position of the highest C : Luminance at position of lowest brightness

6. Color Point

Value	9300° K X = 0.283 ±0.02, Y = 0.298 ±0.02
Conditions	Display Image : White flat field at the center of display area. Luminance Min : 5 FL, Max : 20 FL

7. Misconvergence

Center area of display ("A" circle is 270 mm) (A) : 0.3 mm
Peripheral area of display (B) : 0.5 mm



1) Conditions
Display Image : Crosshatch pattern mixed with R,G,B colors.

8. Purity

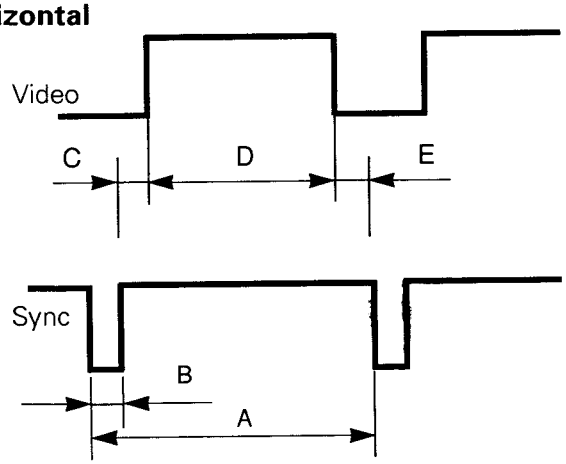
Conspicuous mislanding shall not be visible within display area at distance of 50 cm from CRT surface

1) Conditions
Display image : White flat field.
Luminance : 15 FL at the center of display area.

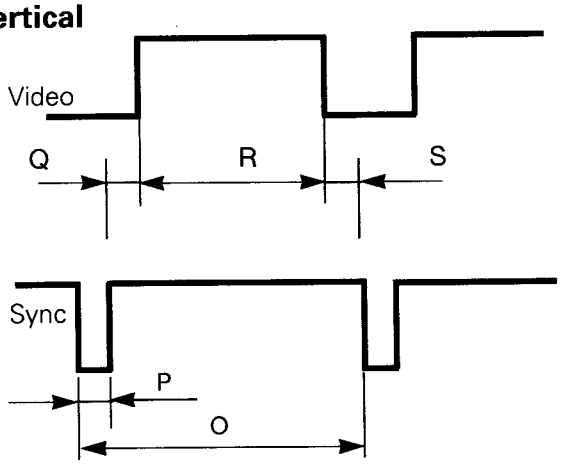
SIGNAL TIMING CHART

Mode / Timing	IBM					VESA
	VGA1/70 Hz	VGA2/70 Hz	VGA3/60 Hz	XGA/87i Hz	XGAII/75 Hz	Ergo VGA
	640×350	720×400	640×480	1024×768	1024×768	640×480
FH(KHz)	31.469	31.469	31.469	35.522	61.080	37.861
A μsec	31.778	31.777	31.778	28.151	16.372	26.413
B μsec	3.813	3.813	3.813	3.920	3.721	1.270
C μsec	1.907	1.907	1.907	1.247	0.651	4.064
D μsec	25.422	25.422	25.422	22.806	11.907	20.317
E μsec	0.636	0.636	0.636	0.178	0.093	0.762
Fv (Hz)	70.086	70.087	59.940	86.958	75.781	72.809
O msec	14.268	14.268	16.683	11.500	13.196	13.735
P msec	0.064	0.064	0.064	0.113	0.131	0.079
Q msec	1.907	1.080	1.048	0.563	0.491	0.739
R msec	11.122	12.711	15.253	10.810	12.574	12.678
S msec	1.176	0.413	0.318	0.014	0.000	0.237
Clock Fre. (MHz)	25.175	28.322	25.175	44.900	86.000	31.500
Polarity						
H. Sync	Positive	Negative	Negative	Positive	Positive	Negative
V. Sync	Negative	Positive	Negative	Positive	Positive	Negative
Remark	—	—	—	Interlace	—	—

Horizontal



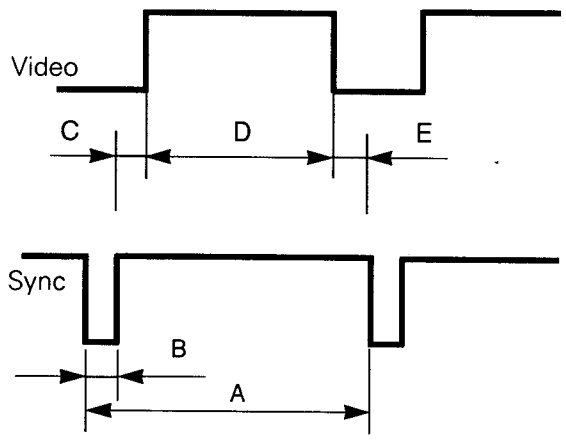
Vertical



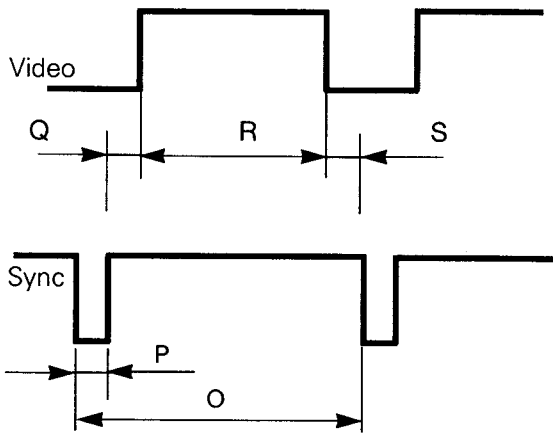
SIGNAL TIMING CHART

Mode / Timing	VESA			SAMSUNG		IBM SUN
	800/56 Hz	800/72 Hz	1024/70 Hz	1280/60 Hz	1280/72 Hz	1280/76 Hz
	800×600	800×600	1024×768	1280×1024	1280x1024	1280X1024
fH (kHz)	35.156	48.077	56.476	63.702	76.968	81.130
A μsec	28.444	20.800	17.707	15.698	12.992	12.326
B μsec	2.000	2.400	1.813	1.358	1.203	0.474
C μsec	3.556	1.280	1.920	1.811	2.045	2.133
D μsec	22.222	16.000	13.653	12.075	9.624	9.481
E μsec	0.667	1.120	0.320	0.453	0.120	0.237
fv (Hz)	56.250	72.188	70.069	60.096	71.932	76.107
O msec	17.778	13.853	14.272	16.640	13.902	13.139
P msec	0.057	0.125	0.106	0.047	0.091	0.099
Q msec	0.626	0.478	0.513	0.471	0.494	0.394
R msec	17.067	12.480	13.599	16.075	13.304	12.622
S msec	0.028	0.770	0.053	0.047	0.013	0.025
Clock Frq. (MHz)	36.000	50.000	75.000	106.000	133.000	135.000
Polarity H. Sync V. Sync	 Posi./Nega. Posi./Nega.	 Positive Positive	 Negative Negative	 Negative Negative	 Positive Positive	 Negative Negative
Remark	—	—	—	—	—	—

Horizontal

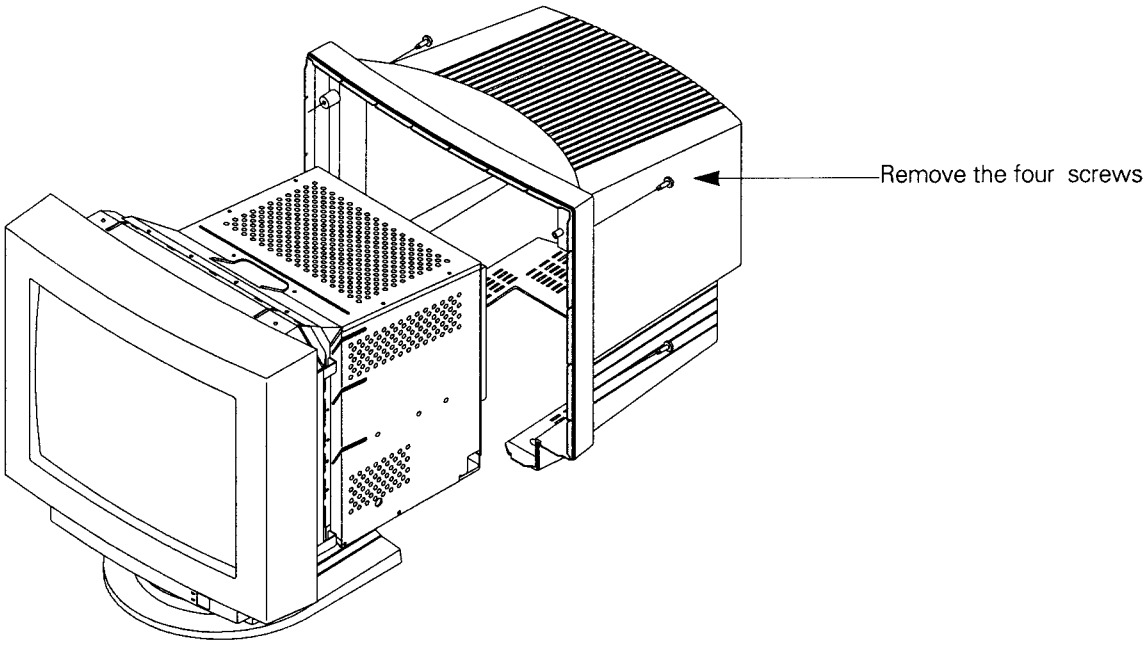


Vertical

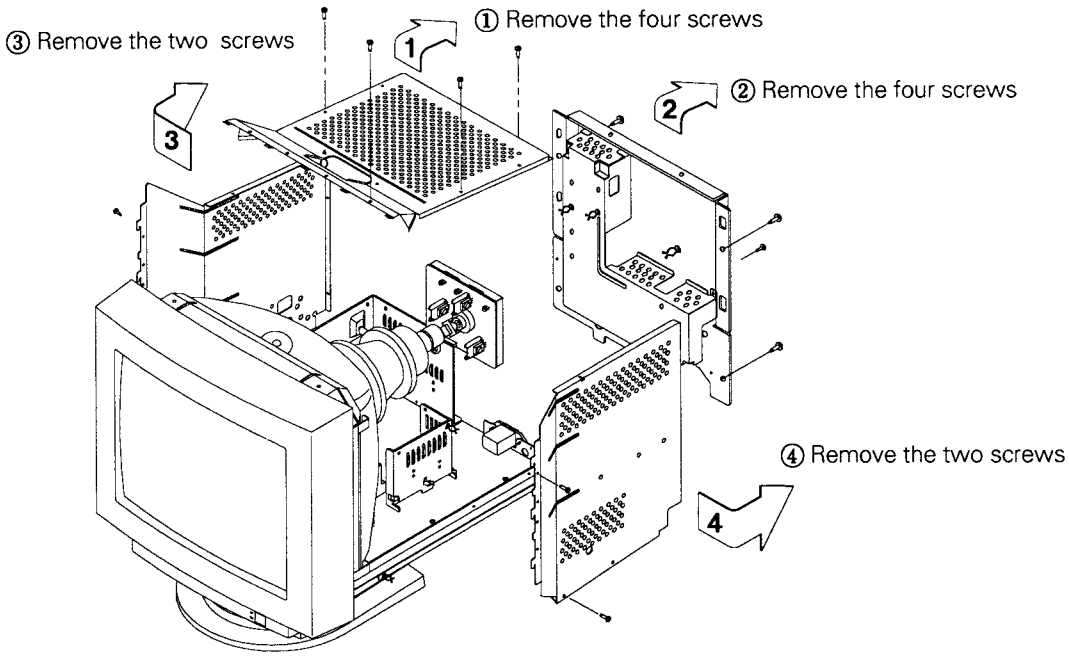


DISASSEMBLY

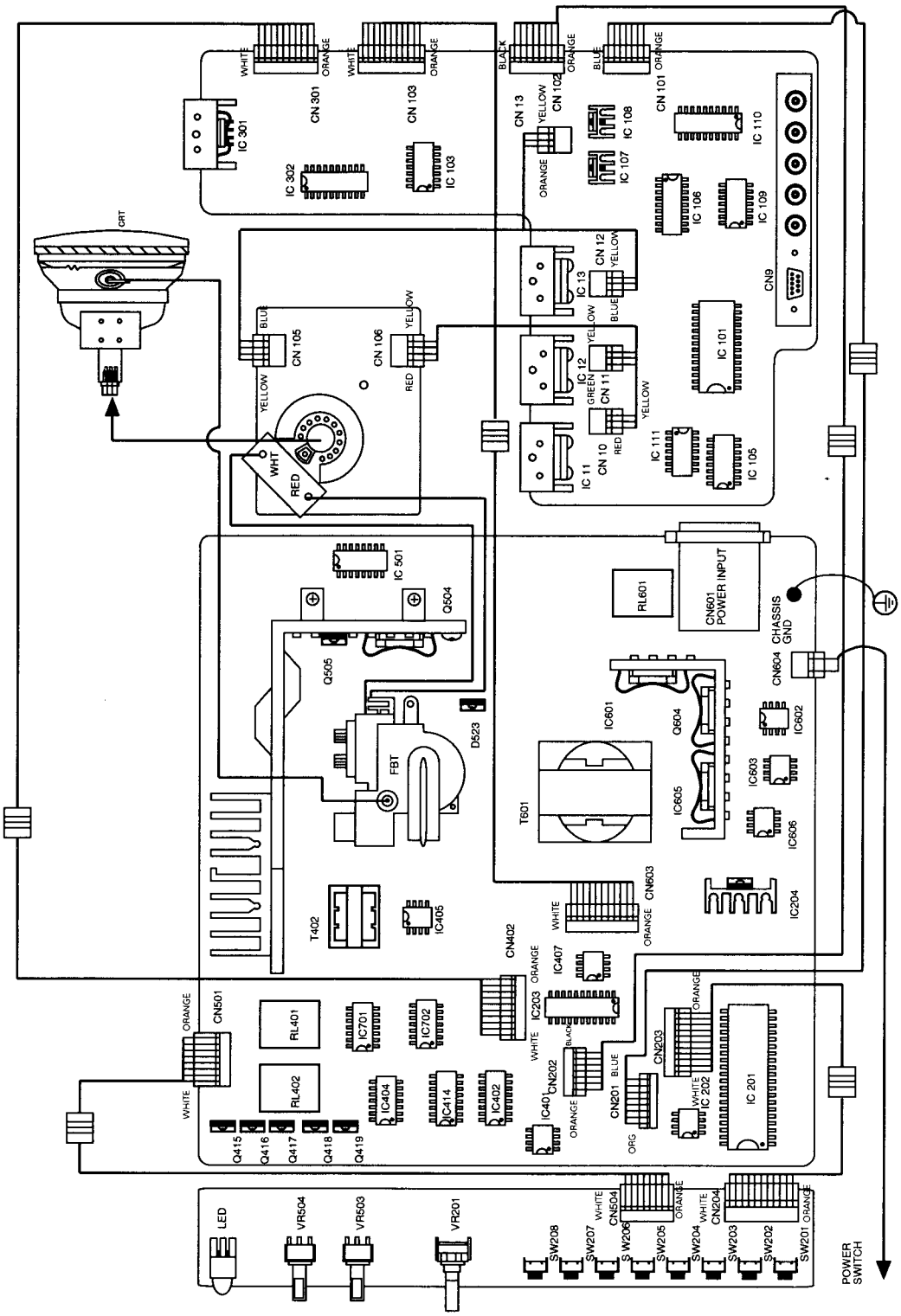
1. Stand & Cabinet Removal



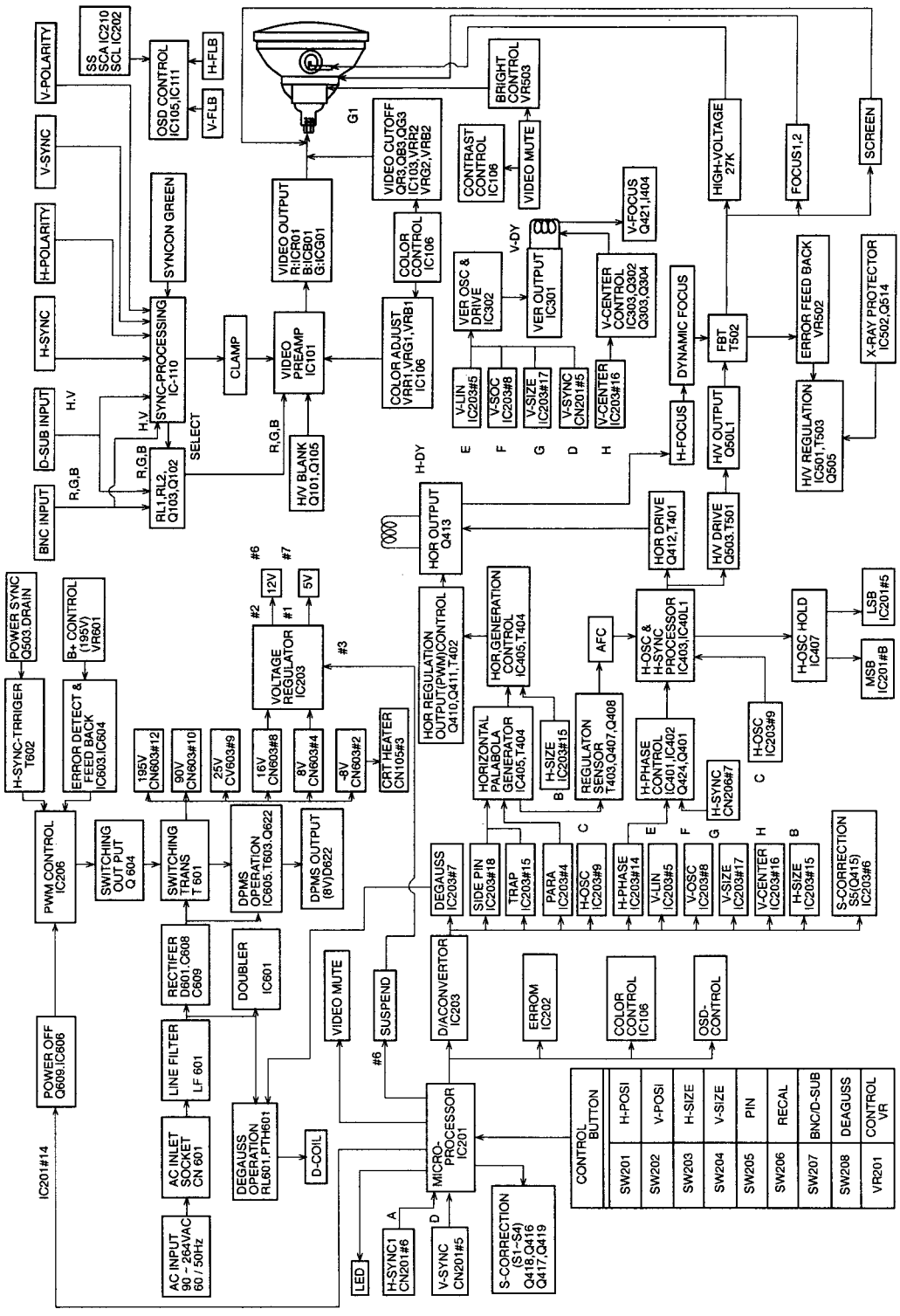
2. Bottom Shield Removal



WIRING DIAGRAM



BLOCK DIAGRAM



ALIGNMENT PROCEDURE

1. Adjustment Conditions and Precautions

1) Power supply voltage
AC 100-120/220-240 volt (60/50 Hz).

2) Warm up time
The display must be on for 30 minutes before starting alignment. This is especially critical in color temperature and white balance adjustments.

3) Signal
Video analog 0.714 Vp-p positive at 75 ohm terminated.

SYNC On Green : Video 0.714 Vp-p positive.
: SYNC 0.286 Vp-p negative.
SYNC : TTL level negative/positive, separate , composite.

4) Scanning frequency
Horizontal : 30 kHz-82 kHz (Automatic).
Vertical : 50 Hz-120 Hz (Automatic).

Unless otherwise specified, adjust at 1280x1024 (fH: 76.9 kHz, fv: 72 Hz) signals.

CAUTION

☞ Alignment procedure without micom control jig: You can do adjust this step after set the monitor to the burn-in mode. (See Page 3-5)

☞ Alignment procedure with micom control jig: Before doing below steps,

① Apply standard timing (1280x1024/72 Hz) to a monitor.
② Keep pressing button #㉗ (Select Monitor Type) until below messages are appeared on LCD panel.

MANUAL - CONTROL
20" H - SAMSUNG

③ Press a button #㉔ (Memory Data Dump) on the Micom control jig to call the data of the all mode based 1280x1024/72 Hz.
④ Please refer to block diagram of the Micom control jig on the Page 9-3.

2. Main PWB Prepare Adjustment

1) +B 195V Line adjustment
Adjust VR601 to be DC 195 ±1 V at 195V test point and GND. (No Beam Contrast: MIN, Brightness: MIN)

2) High voltage control
Adjust VR501 to be 27.0 kV ±0.5 kV.
(No Beam Contrast: MIN, Brightness: MIN)

3. Main PWB Adjustment

- Unless otherwise specified, adjust the EXT-VR
VR504 (Contrast) : MAX (Fully clockwise).
VR503 (Brightness) : MAX (Fully clockwise).

- Apply standard timing (76.9 kHz/72 Hz) to the monitor.

1) Horizontal Raster Center
Adjust SW401 so that the position of back raster move to center when signal of 81.1 kHz/76 Hz is applied.

2) Vertical Linearity
- Alignment procedure without micom control jig:
Push the horizontal position button and the horizontal size button simultaneously for 4-5 seconds to activate the vertical linearity adjustment function. Use the variable adjustment control.

- Alignment procedure with micom control jig:
Push vertical linearity up button (#⑮ button) or vertical linearity down button (#⑯ button) so that the image or pattern becomes optimum.

3) Horizontal Position Adjustment
- Adjustment procedure without micom control jig:
After pushing the Horizontal Position button, adjust variable adjustment control so that the image (or the test pattern) is placed on the center of the raster.

- Adjustment procedure with micom control jig:
Push Horizontal Position Up button (#① button on the Micom Control Jig) or Horizontal Position Down button (#② button) so that the image (or the test pattern) is placed on the center of the raster.

4) Vertical Position Adjustment
- Alignment procedure without micom control jig:
After pushing the Vertical Position button, adjust variable adjustment control so that the image (or the test pattern) is placed on the center of the raster.

- Alignment procedure with micom control jig:
  Push Vertical Position Up button (#⑤ button) or Vertical Position Down button (#⑥ button) so that the vertical image or pattern is placed on the center of the raster.

5) Horizontal Size Adjustment

- Alignment procedure without micom control jig:
  After pushing the Horizontal Size button, adjust variable adjustment control so that the horizontal width of the displayed pattern becomes 360 mm. (The tolerance is ±3 mm)

- Alignment procedure with micom control jig:
  Push Horizontal Size Up (#④ button) or Horizontal Size Down button (#③ button) so that the horizontal width of the displayed pattern becomes 360 mm. (The tolerance is ±3mm)

6) Vertical Size Adjustment

- Alignment procedure without micom control jig:
  After pushing the Vertical Size button, adjust variable adjustment control so that the vertical size of the displayed pattern becomes 270 mm. (The tolerance is ±3mm)

- Alignment procedure with micom control jig:
  Push Vertical Size Up button (#⑦ button) or Vertical Size Down (#⑧ button) so that the vertical image or pattern becomes 270 mm. (The tolerance is ±3mm)

7) Side Pincushion Adjustment

- Alignment procedure without micom control jig:
  After pushing the Side Pincushion button, adjust variable adjustment control so that each side of the pattern (or the image) becomes straight.

- Alignment procedure with micom control jig:
  Push Side Pincushion Up button (#⑨ button) or Side Pincushion Down button (#⑩ button) so that each side of the pattern or image becomes straight.

8) Parallelogram Adjustment

- Alignment procedure without micom control jig:
  Keep pressing the Horizontal Position button and Vertical Position button simultaneously for 4-5 seconds to active the parallelogram function. Use the variable adjustment control.

- Alignment procedure with micom control jig:
  Push Parallelogram Up button (#⑬ button) or Parallelogram Down button (#⑭ button) so that the image or pattern becomes to rectangular.

9) Trapezoid Adjustment

- Alignment procedure without micom control jig:
  Push Side Pincushion button twice to access the trapezoid distortion function. Use the variable adjustment control to correct any trapezoid distortion of the display.

- Alignment procedure with micom control jig:
  Push Trapezoid Up button (#⑪ button) or Trapezoid Down button (#⑫ button) so that the image or pattern becomes to rectangular.

10) To save the picture data to a monitor

- Alignment procedure with micom control jig:
  To save the picture data of a mode, push Standard Save button. (#㉓ button on the Micom control)

11) To save the picture data of all factory preset mode

- Alignment procedure with micom control jig:
  If you finished above adjustment when standard timing (76.9 kHz/72 Hz) is applied to the monitor, push All Mode Save button (#㉕ button on the micom control), then micom save calculated picture data (based on standard timing) of 16 modes including 12 factory preset modes.

12) Pin Balance

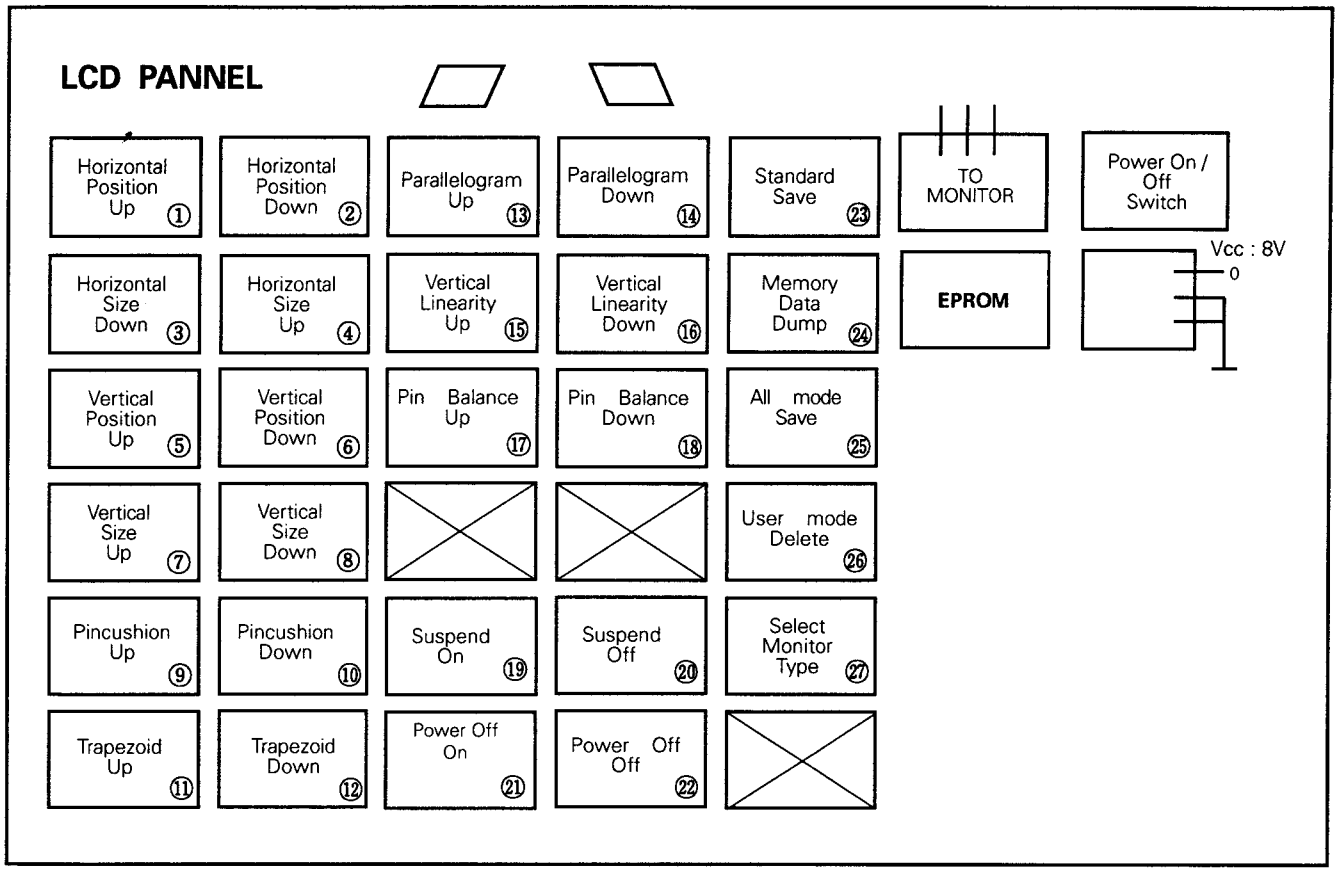
- Alignment procedure without micom control jig:
  Push the horizontal position button and the vertical size button simultaneously for 9-10 seconds to activate the pin balance adjustment function use the variable adjustment control.

- Alignment procedure with micom control jig:
  Push Pin Balance up button (#⑰ button) or Pin Balance down button (#⑱ button) so that the image or pattern becomes to rectangular.

You just finished adjustment at standard timing (76.9 kHz/72 Hz). If you want to adjust other modes, you can do it by following above step from (3) to (11), not to (12).

ALIGNMENT PROCEDURE

The Block Diagram of the Micom control Jig (Alignment Procedure with micom control jig)



Note:

1) Standard save button (#㉓ button)
   - To save the picture data of a mode individually.
2) All mode save button (#㉕ button)
   - To save the picture data of all mode (16 modes) referring standard mode (1024x768/75 Hz).
3) Memory data dump button (#㉔ button)
   - To call the standard picture data from EPROM on the Micom Control Jig.
4) User mode delete button (#㉖ button)
   - To delete the data in the user mode. (Saved by a user)
5) Select monitor type button (#㉗ button)
   - To select the picture data which be dumped from EPROM on the Micom Control Jig by a CRT. Keep pressing for 2 seconds.
6) Suspend mode test button (#⑲, #⑳ buttons)
   - To test the suspend function among the power management function.
   - Push suspend on button (#⑲ button), then the monitor becomes to suspend mode.
     And push suspend off button (#⑳ button), then the monitor returns to normal operation status.
7) Power-Off mode test button (#㉑, #㉒ buttons)
   - To test the Power-Off function among the power management function.
   - Push Power-Off On button (#㉑ button), then the monitor becomes to Power-Off mode, and push Power-Off Off button (#㉒ button), then the monitor returns to normal operation status.

4. Adjustment of Video PWB

Note: Before performing this adjustment procedure, check that the video signals are as follows.

Video : Analog 0.714 Vp-p (at 75Ω Terminated).
SYNC : Synchronizing : Separate TTL level.
Unless otherwise specified,
use signal 1280x1024/72 Hz for the adjustments.

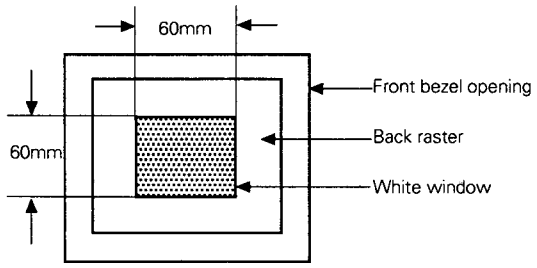
4-1. Adjustment of video amplitude and white balance of back raster

Locate VRR1 (R-Gain), VRG1 (G-Gain), VRB1(B-Gain) controls on the video PWB to mechanically center position. Locate VRR2 (R-Bias), VRG2 (G-Bias), VRB2 (B-Bias) controls on the video PWB to mechanically center position.

4-2. Video Contrast Adjustment

Adjust of gain control (76 kHz)
(White window pattern)

1) Display the white window pattern(within a range for which the ABL circuit does not active even though maximum contrast is set) preferably with video area of 60x60mm approminately.



2) Turn brightness controls fully clockwise and turn the contrast controls fully counterclockwise.

3) Adjust the screen VR of FBT so that the brightness of back raster is to be 0.3 to 0.6 Ft/L. (Typically 0.5 Ft/L)

4) Adjust the VRR2(R-Bias), VRB2(B-Bias) so that the back raster color is white.
(X=0.283 ±0.02 , Y=0.298 ±0.02)

5) Turn the contrast controls fully clockwise and turn the brightness controls fully counterclockwise.

6) Adjust the VRR1 (R-Gain), VRB1 (B-Gain) so that the video is to be white. (X=0.283 ±0.02 , Y=0.298 ±0.02)

7) Turn the contrast and the brightness controls fully clockwise.

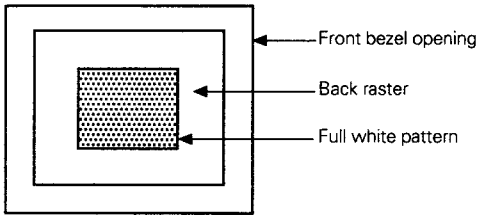
8) Adjust the sub-contrast (VR3) so that the brightness of white window is to be 45 Ft/L.

9) And check whether the white window of video meets the above coordinate SPEC and brightness (over 45 Ft/L) or not.

10) If the white balance and brightness is off for the above SPEC, re-adjustment must be done. (Following above procedure again)

4-3. Adjustment of White Balance of Video

1) Display a full white pattern.



2) Turn the contrast and the brightness controls fully clockwised.

3) Adjust the ACL VR (VR502) controls on the main PWB so that the brightness of video is to be about 27 ±1 Ft/L.

4-4. Fine Adjustment of White Balance

Note : White coordinate (X=0.283 ±0.02, Y=0.298 ±0.02)
Do not touch VRG1 (G-Gain)

1) Display the full white pattern.

2) Turn the contrast control so that the brightness of video is to be about 5 Ft/L.

3) And check whether the white coordinate of video meets the above coordinate SPEC or not.

4) For the contrast control so that the brightness of video is about 15 Ft/L.

5) Check whether the white coordinate of video satisfy above SPEC or not.

6) If the white balance is off for the above SPEC, re-adjustment must be done. (Following above procedure again)

ALIGNMENT PROCEDURE

5. Focus Adjustment

1) Display the character pattern so that adjust the focus can be done. (the highest resolution is recommended)

2) Turn the contrast and the brightness controls fully clockwised.

3) Adjust focus of center area using fcus control marked "V" first, then focus of coner area using focus control marked "H" later. For better focus condition, repeat above adjustment again.

6. Purity Adjustment

1) Be sure that the display is not exposed to any external magnetic fields.

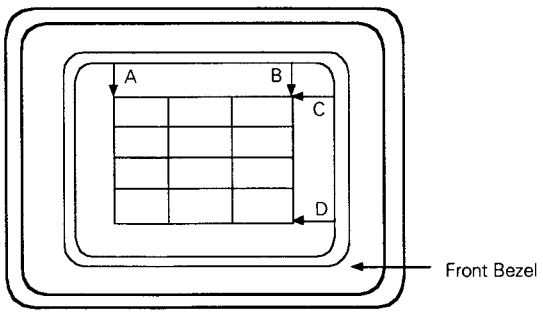
2) Ensure that the spacing between the purity convergence magnet (PCM) assembly and the CRT stem is 29 mm ±1 mm

3) Produce a complete, red pattern on display. Adjust the purity magnet rings on the PCM assembly to obtain a complete field of the color red. This is done by moving the two tabs in such a manner that they advance is an opposite direction but at the same time to obtain the same angle between the two tags, which should be approximately 180°.

4) Check the complete blue and complete green patterns to observe their respective color purity. Make minor adjustment is needed.

7. CRT Tilt Adjustment

Reassembly the CRT with fastening screws so that the simension A, B and C, D are separately equal.



8. Static(Center) Convergence

Switch the monitor on and warm up for 15 minutes. Operate the computer in such a way that the cross hatch pattern is displayed on screen. Convergence error should not be over than following table.

Position	Error In (mm)	CRT Dot Pitch	Model No.
Center	0.3	0.28	CFG9677,CFG9677L
Corner	0.5	0.28	CFG9677,CFG9677L

Proceed as follows:

1) Locate the pair of four pole magnet rings.

2) Rotate the individual rings (change spacing between tabs) to converge the vertical red and blue lines.

3) Rotate the pair of rings (maintaining spacing between tabs) to converge the horizontal red and blue lines.

4) After completing the red and blue center convergence, locate the pair of six pole magnet ring.

5) Rotate the individual rings (change spacing between tabs) to converge the vertical red and blue (magenta) and green lines.

6) Rotate the pair of rings (maintaining spacing between tabs) to converge the horizontal red and blue (magenta) and green lines.

7) Magnet position is 2 pole/4 pole/6 pole (from the front of CRT).

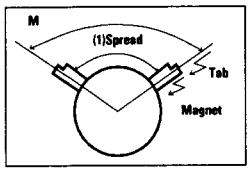
8) Don't rotate the 2 pole magnet because it's object is to adjust the purity.

9. Dynamic Convergence

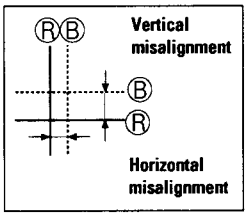
Dynamic convergence (convergence of the three color fields at the edge of the CRT screen) is accomplished by the proper insertion and positioning of the three wedges between the edge of deflection yoke and the funnel of the CRT.

9-1. Alignment of (R) and (B) with the 4pole magnet

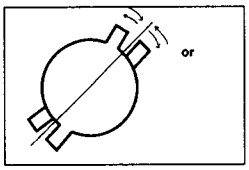
Movable in spread condition



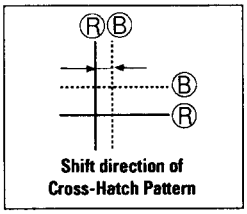
O-MAGNETIC FIELD



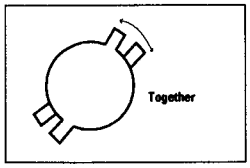
Vertical direction



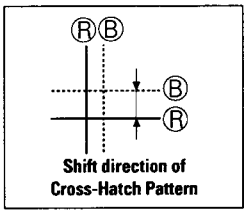
MOTION (1)



Horizontal direction

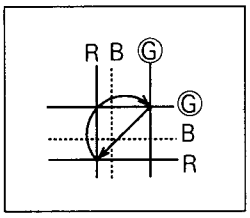


MOTION (2)

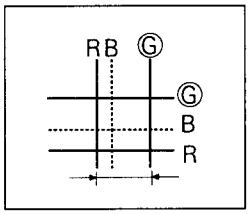


9-2. Alignment of (R) and (B) with (G) (6 pole magnet)

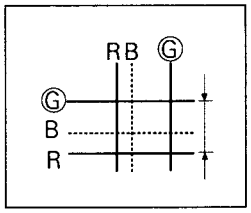
O-MAGNETIC FIELD



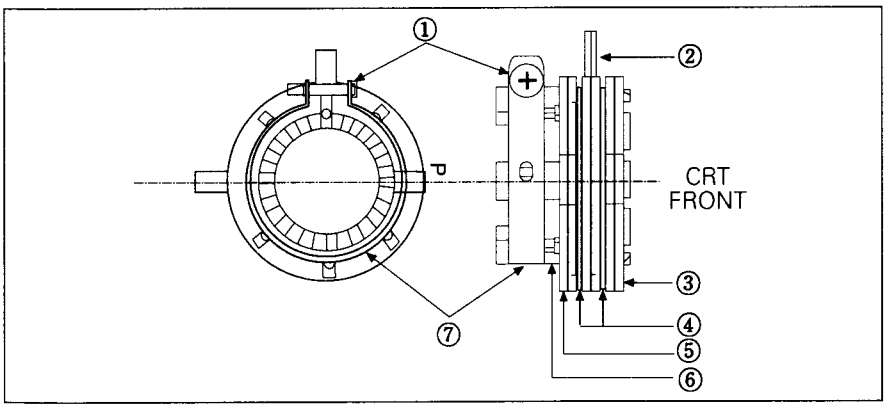
MOTION (1)



MOTION (2)



9-3. Convergence Purity Magnet

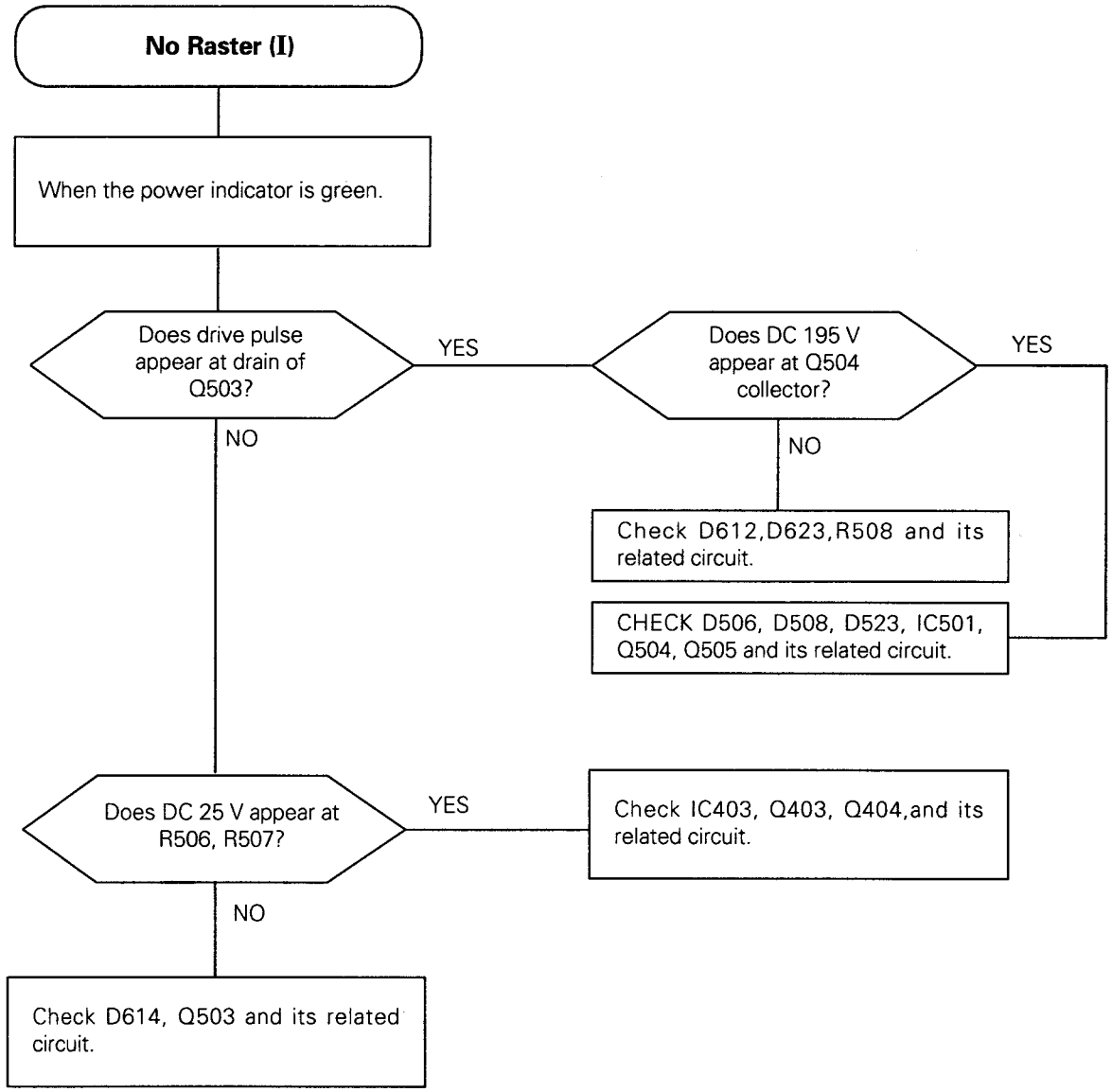


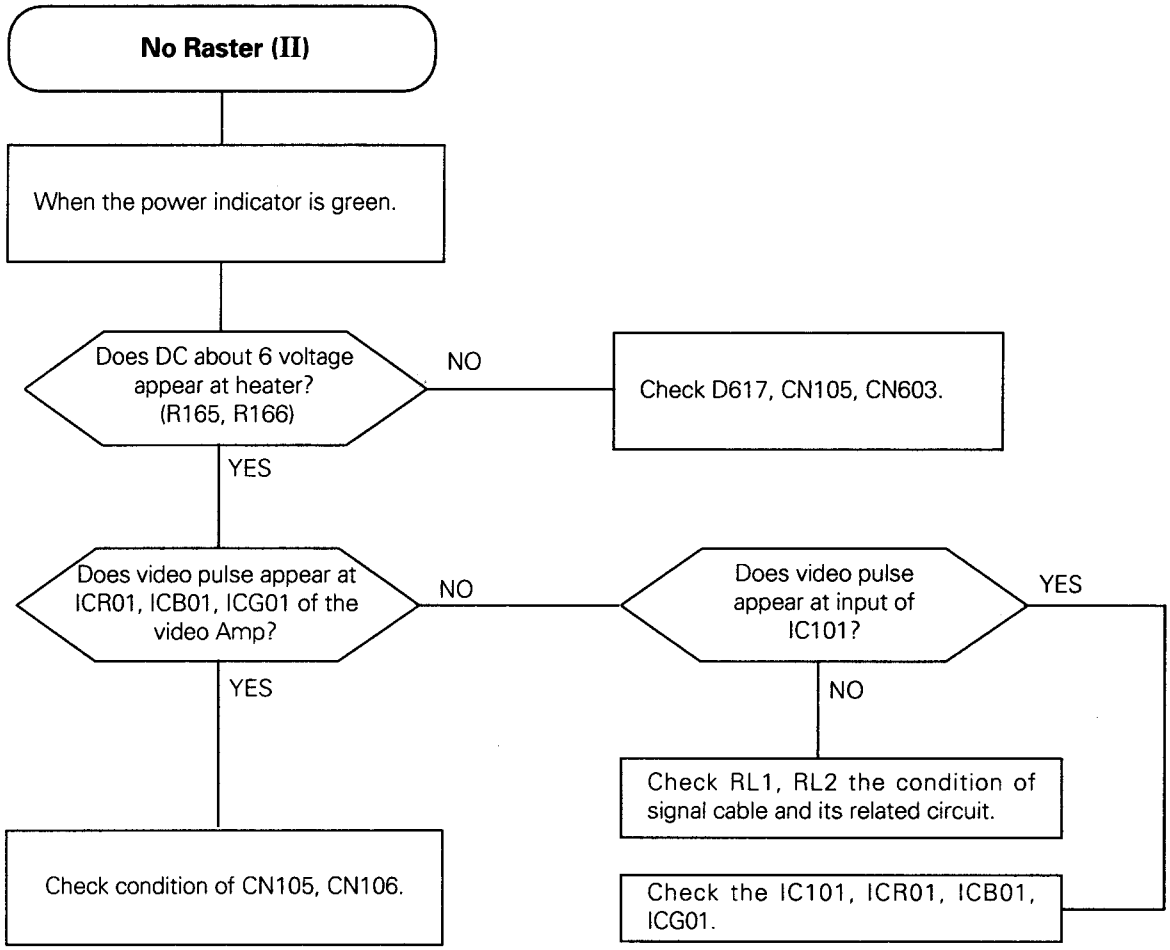
① Setup Bolt	② 4-Pole Magnet	③ Purity Magnet	④ Spacers
⑤ 6-Pole Magnet	⑥ Holder	⑦ Band	

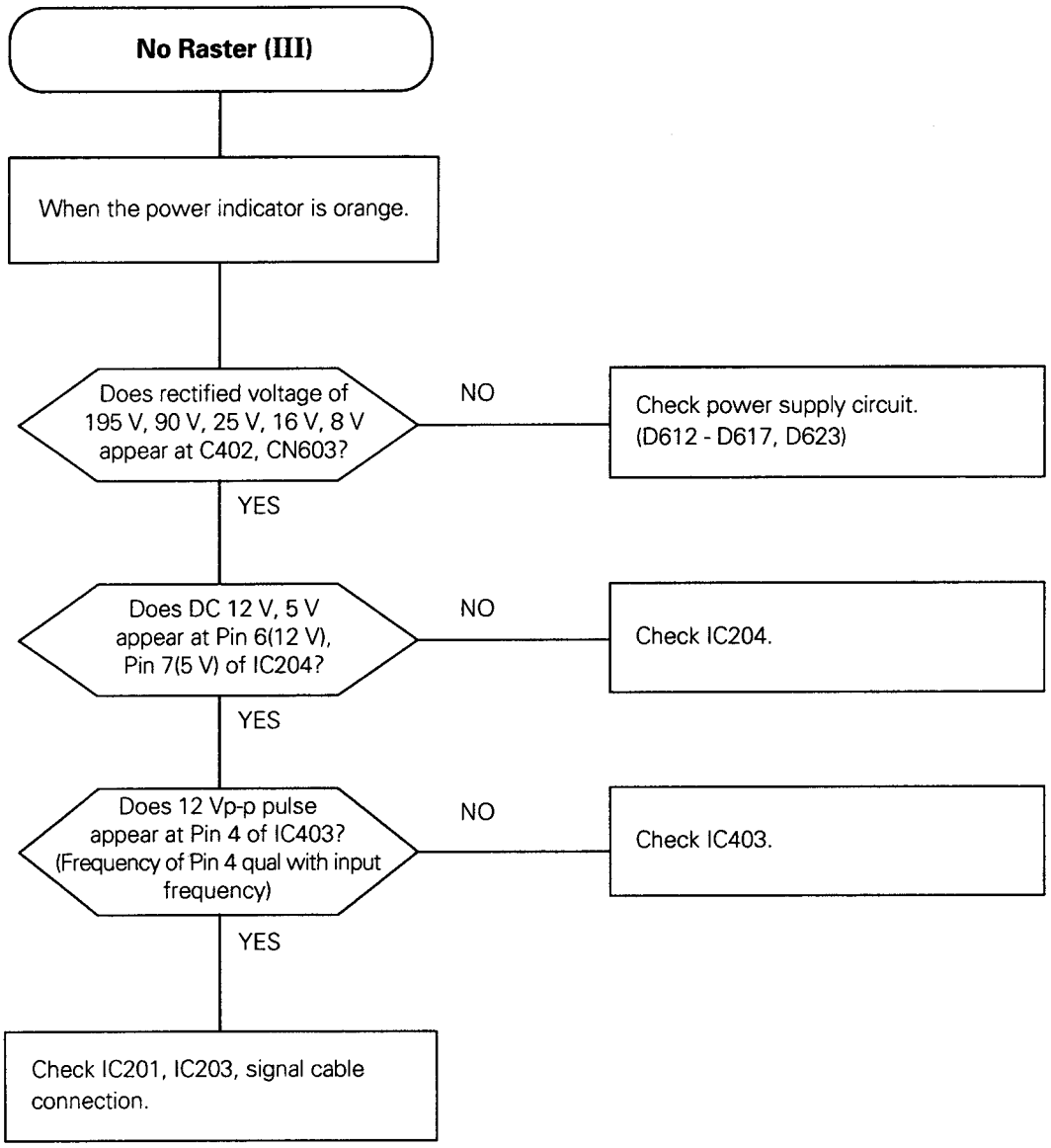
TROUBLESHOOTING

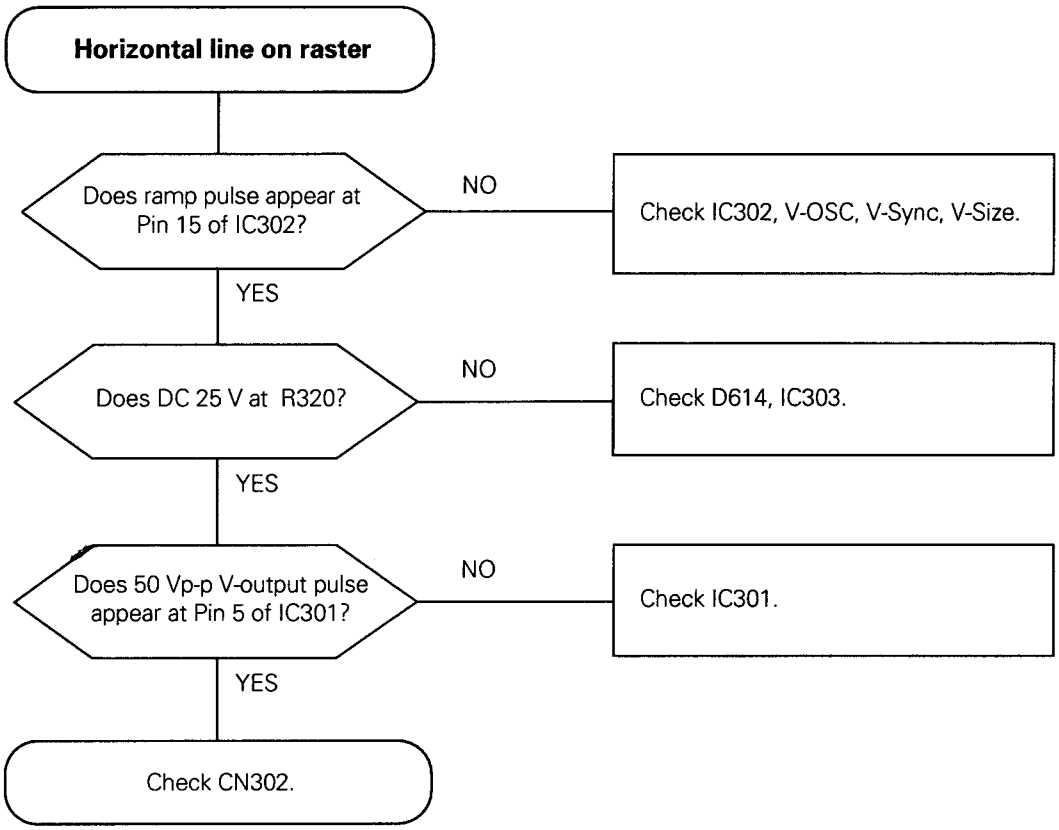
Note :

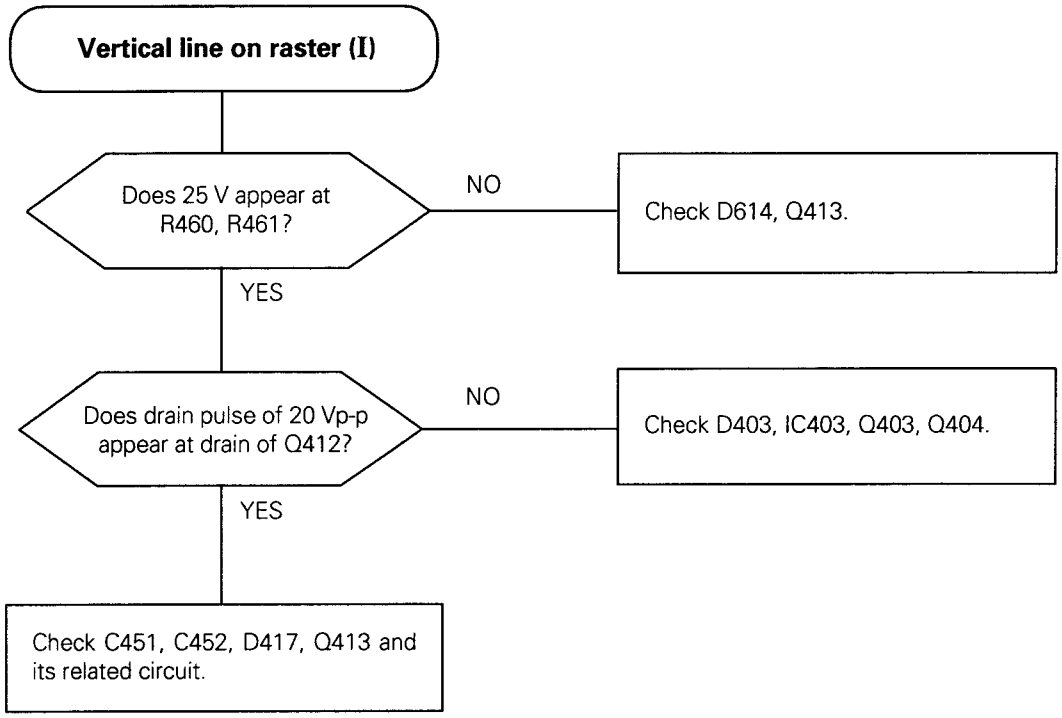
1. If picture does not appear, fully rotate the brightness and contrast control clockwise before inspection.
2. Circuit to be checked
   - ① No raster appears : Power circuits, Horizontal output circuits.
   - ② A high voltage develops but no raster appears : Video output circuits.
   - ③ A high voltage is not developed : Horizontal output circuits.

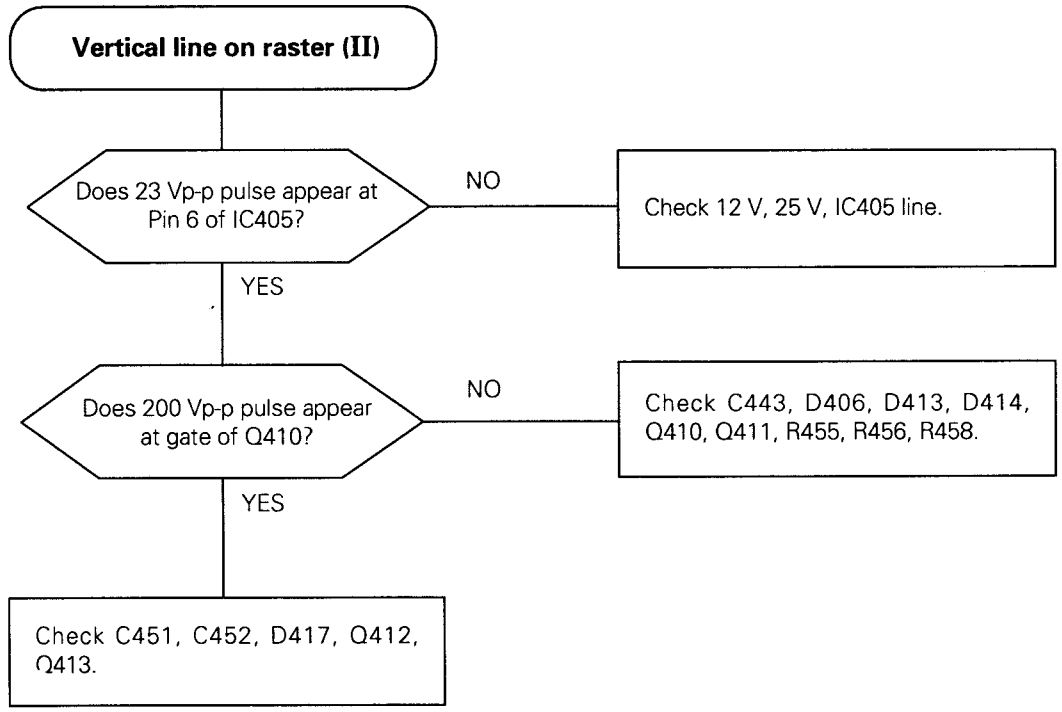

No Raster (I)
When the power indicator is green.
Does drive pulse appear at drain of Q503?
YES
Does DC 195 V appear at Q504 collector?
YES
NO
NO
Check D612,D623,R508 and its related circuit.
CHECK D506, D508, D523, IC501, Q504, Q505 and its related circuit.
Does DC 25 V appear at R506, R507?
YES
Check IC403, Q403, Q404,and its related circuit.
NO
Check D614, Q503 and its related circuit.

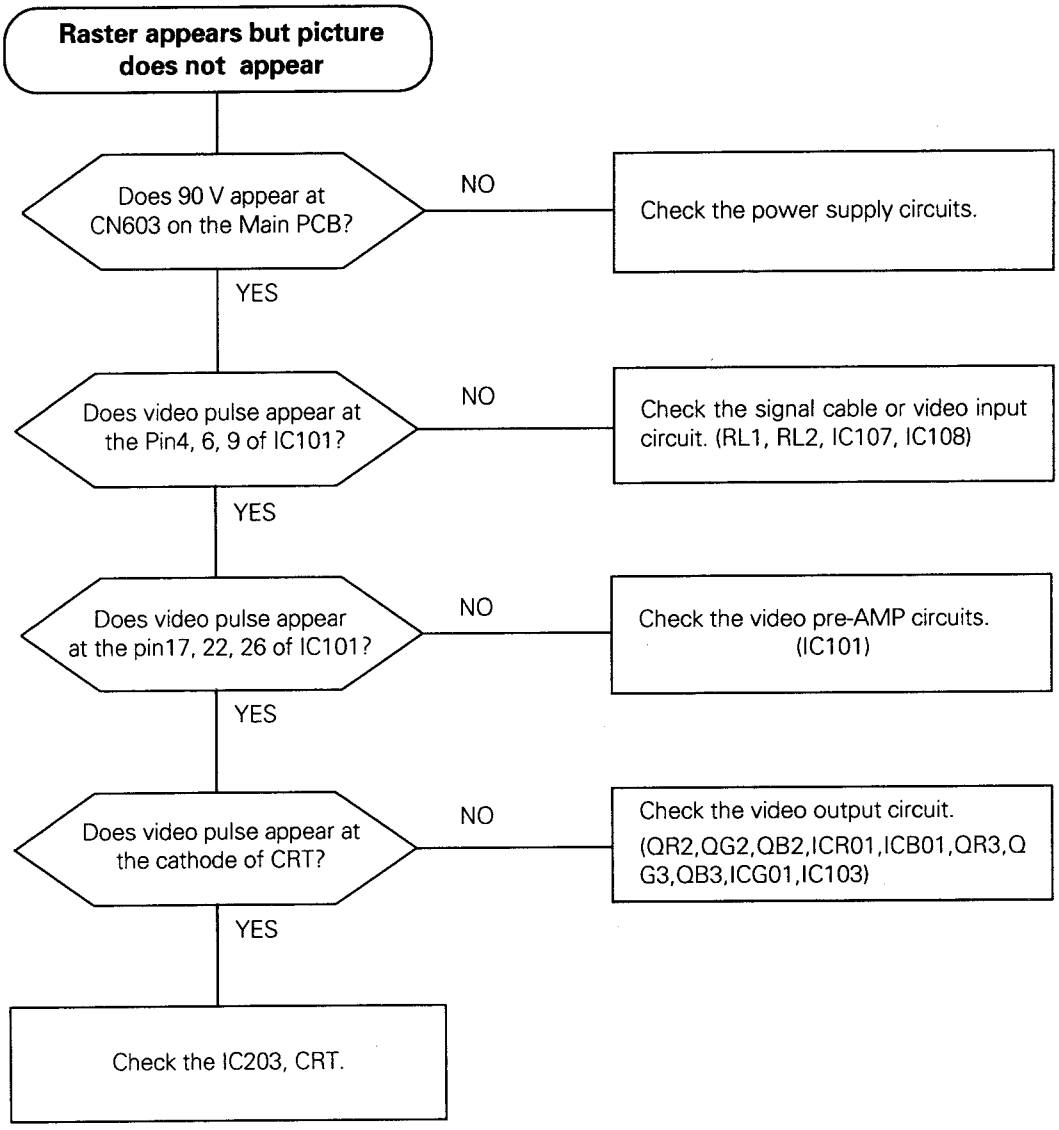

No Raster (II)
When the power indicator is green.
Does DC about 6 voltage appear at heater? (R165, R166)
NO
Check D617, CN105, CN603.
YES
Does video pulse appear at ICR01, ICB01, ICG01 of the video Amp?
NO
Does video pulse appear at input of IC101?
YES
YES
NO
Check RL1, RL2 the condition of signal cable and its related circuit.
Check condition of CN105, CN106.
Check the IC101, ICR01, ICB01, ICG01.

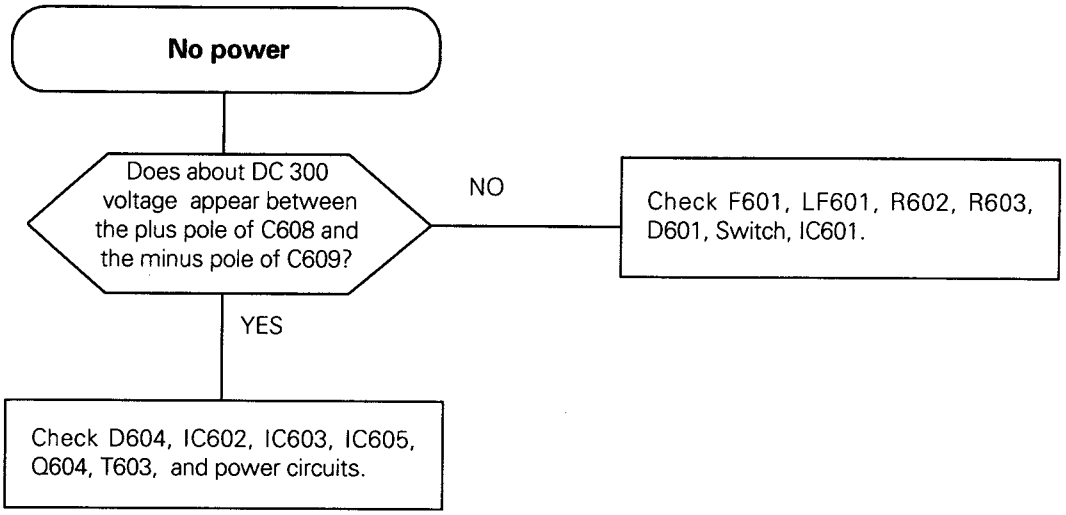

No Raster (III)
When the power indicator is orange.
Does rectified voltage of 195 V, 90 V, 25 V, 16 V, 8 V appear at C402, CN603?
NO
Check power supply circuit. (D612 - D617, D623)
YES
Does DC 12 V, 5 V appear at Pin 6(12 V), Pin 7(5 V) of IC204?
NO
Check IC204.
YES
Does 12 Vp-p pulse appear at Pin 4 of IC403? (Frequency of Pin 4 qual with input frequency)
NO
Check IC403.
YES
Check IC201, IC203, signal cable connection.

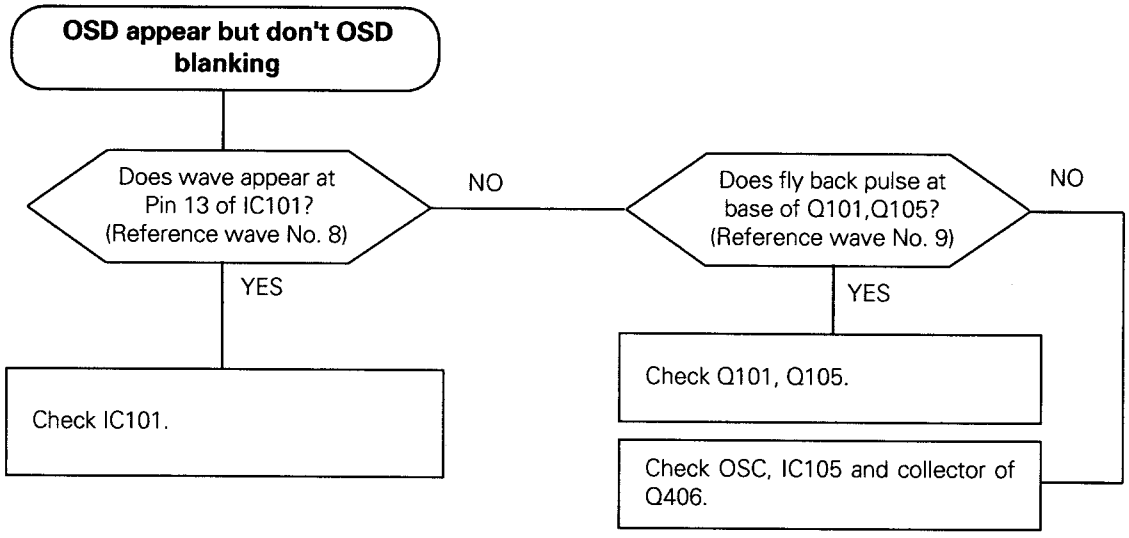

Horizontal line on raster
Does ramp pulse appear at Pin 15 of IC302?
NO
Check IC302, V-OSC, V-Sync, V-Size.
YES
Does DC 25 V at R320?
NO
Check D614, IC303.
YES
Does 50 Vp-p V-output pulse appear at Pin 5 of IC301?
NO
Check IC301.
YES
Check CN302.

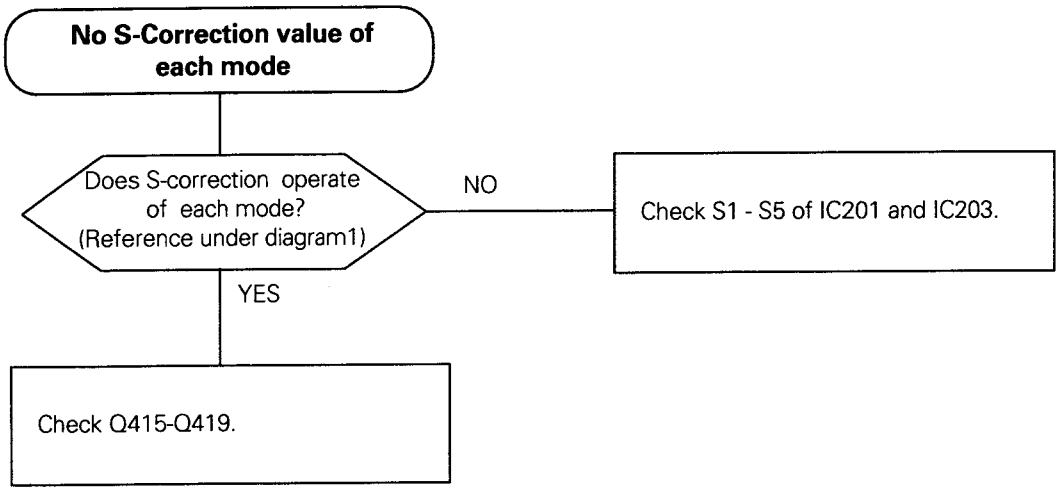

Vertical line on raster (I)
Does 25 V appear at R460, R461?
NO
Check D614, Q413.
YES
Does drain pulse of 20 Vp-p appear at drain of Q412?
NO
Check D403, IC403, Q403, Q404.
YES
Check C451, C452, D417, Q413 and its related circuit.


Vertical line on raster (II)
Does 23 Vp-p pulse appear at Pin 6 of IC405?
NO
Check 12 V, 25 V, IC405 line.
YES
Does 200 Vp-p pulse appear at gate of Q410?
NO
Check C443, D406, D413, D414, Q410, Q411, R455, R456, R458.
YES
Check C451, C452, D417, Q412, Q413.


Raster appears but picture does not appear
Does 90 V appear at CN603 on the Main PCB?
NO
Check the power supply circuits.
YES
Does video pulse appear at the Pin4, 6, 9 of IC101?
NO
Check the signal cable or video input circuit. (RL1, RL2, IC107, IC108)
YES
Does video pulse appear at the pin17, 22, 26 of IC101?
NO
Check the video pre-AMP circuits. (IC101)
YES
Does video pulse appear at the cathode of CRT?
NO
Check the video output circuit. (QR2,QG2,QB2,ICR01,ICB01,QR3,QG3,QB3,ICG01,IC103)
YES
Check the IC203, CRT.

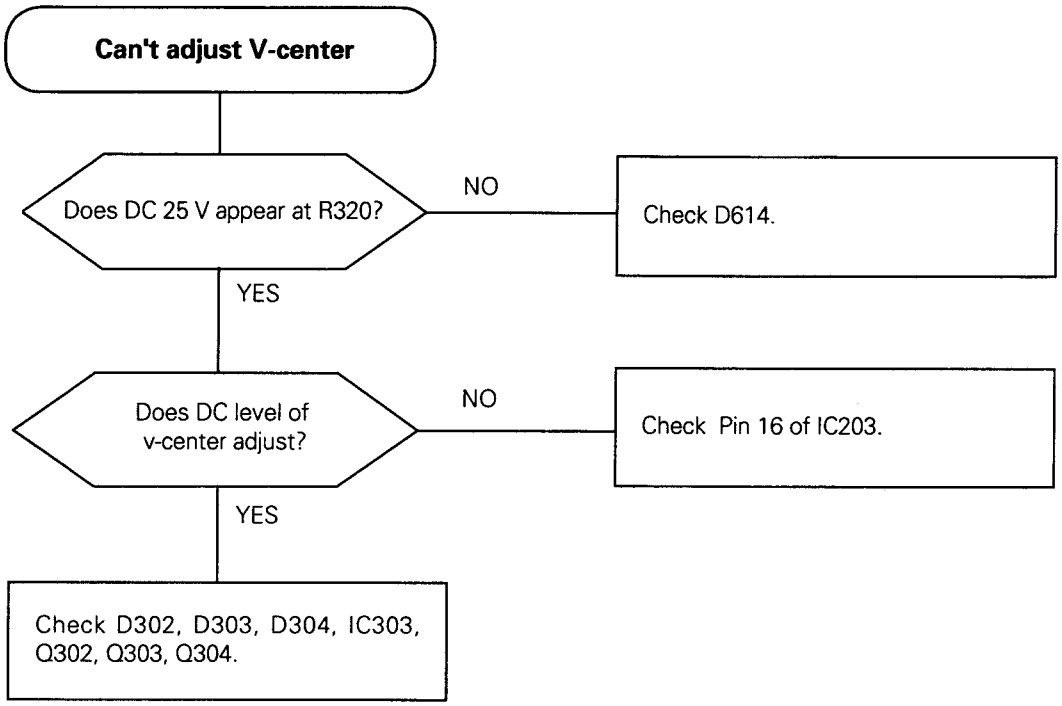

No power
Does about DC 300 voltage appear between the plus pole of C608 and the minus pole of C609?
NO
Check F601, LF601, R602, R603, D601, Switch, IC601.
YES
Check D604, IC602, IC603, IC605, Q604, T603, and power circuits.

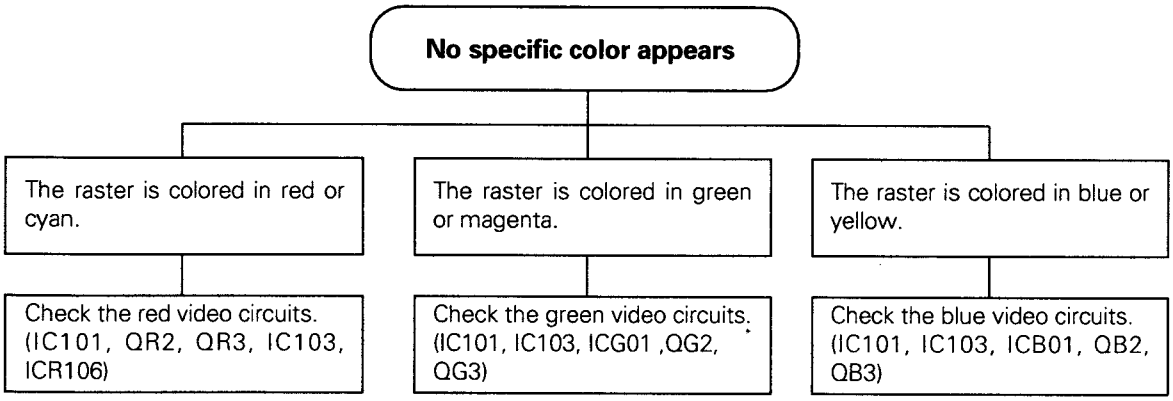

OSD appear but don't OSD blanking
Does wave appear at Pin 13 of IC101? (Reference wave No. 8)
NO
Does fly back pulse at base of Q101,Q105? (Reference wave No. 9)
NO
YES
YES
Check IC101.
Check Q101, Q105.
Check OSC, IC105 and collector of Q406.

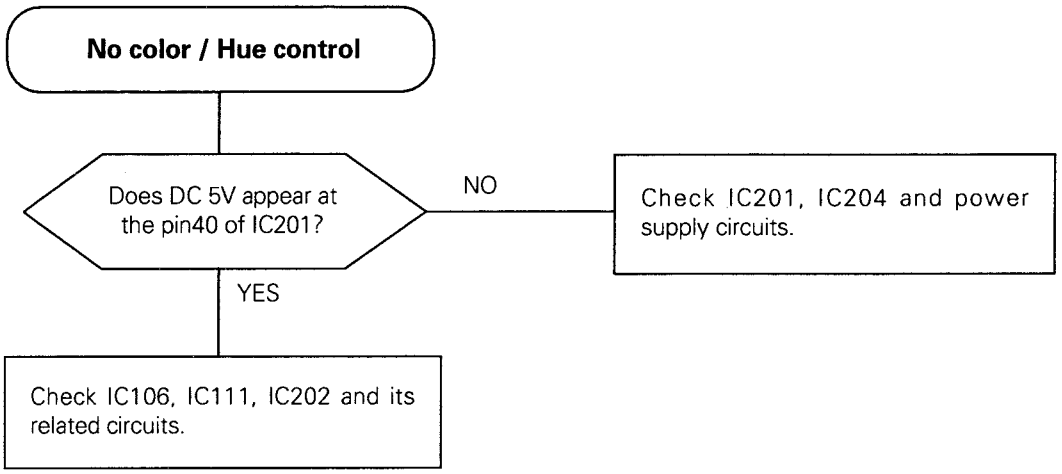

No S-Correction value of each mode
Does S-correction operate of each mode? (Reference under diagram1)
NO
Check S1 - S5 of IC201 and IC203.
YES
Check Q415-Q419.

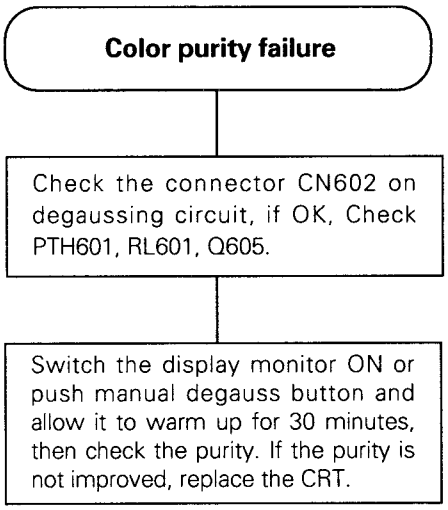
	S5	S4	S3	S2	S1
Under 33kHz	1	1	1	1	1
33 kHz - 40 kHz	0	1	1	1	1
40 kHz - 49 kHz	0	0	1	1	1
49 kHz - 62.5 kHz	0	0	0	1	1
62.5 kHz - 70 kHz	0	0	0	0	1
Over 70 kHz	0	0	0	0	0

Diagram 1

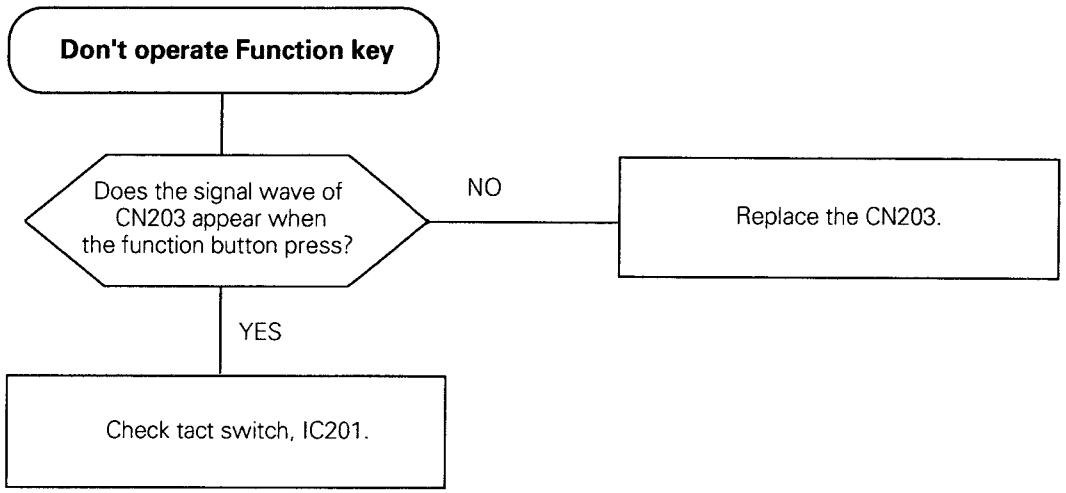

Can't adjust V-center
Does DC 25 V appear at R320?
NO
Check D614.
YES
Does DC level of v-center adjust?
NO
Check Pin 16 of IC203.
YES
Check D302, D303, D304, IC303, Q302, Q303, Q304.

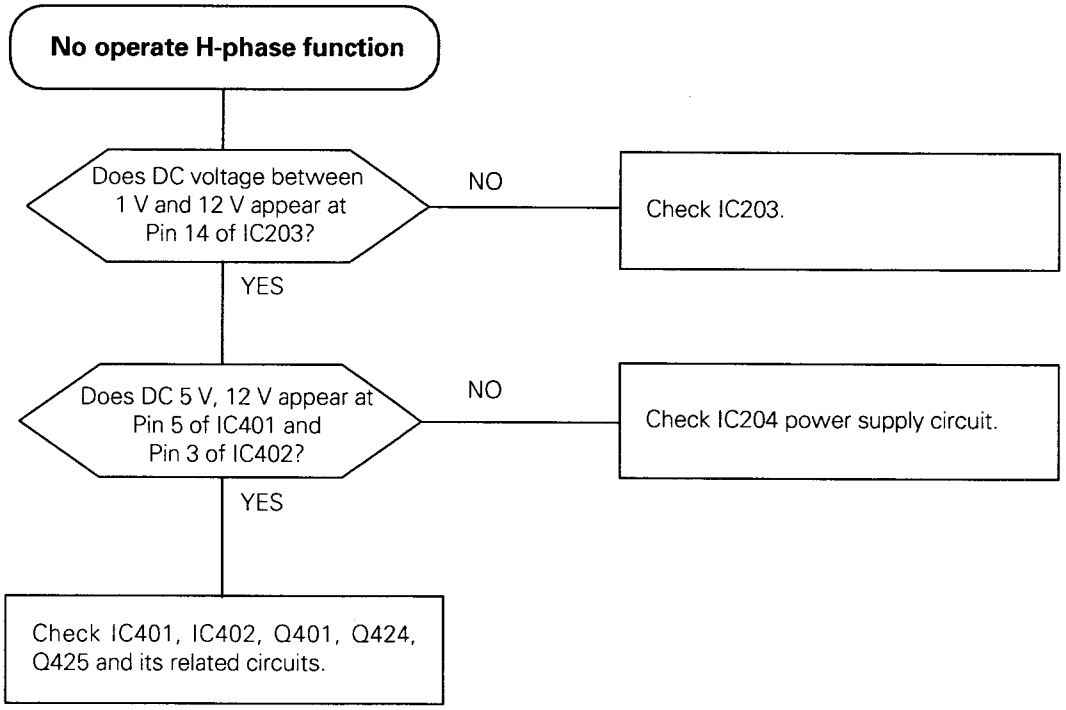

No specific color appears
The raster is colored in red or cyan.
The raster is colored in green or magenta.
The raster is colored in blue or yellow.
Check the red video circuits. (IC101, QR2, QR3, IC103, ICR106)
Check the green video circuits. (IC101, IC103, ICG01 ,QG2, QG3)
Check the blue video circuits. (IC101, IC103, ICB01, QB2, QB3)

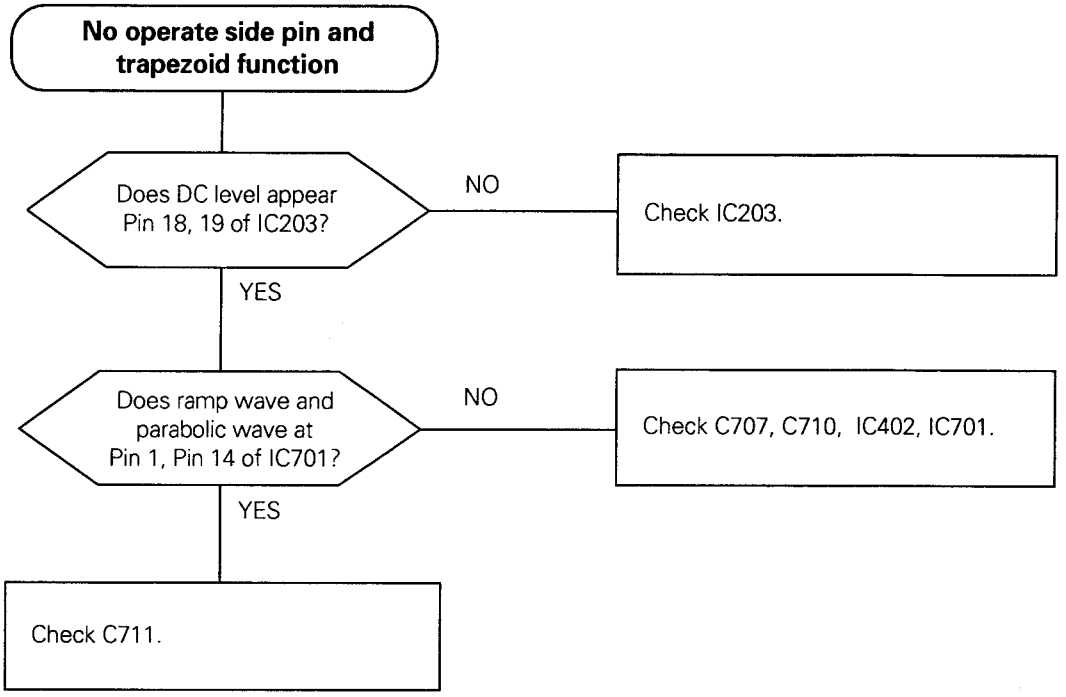

No color / Hue control
Does DC 5V appear at the pin40 of IC201?
NO
Check IC201, IC204 and power supply circuits.
YES
Check IC106, IC111, IC202 and its related circuits.

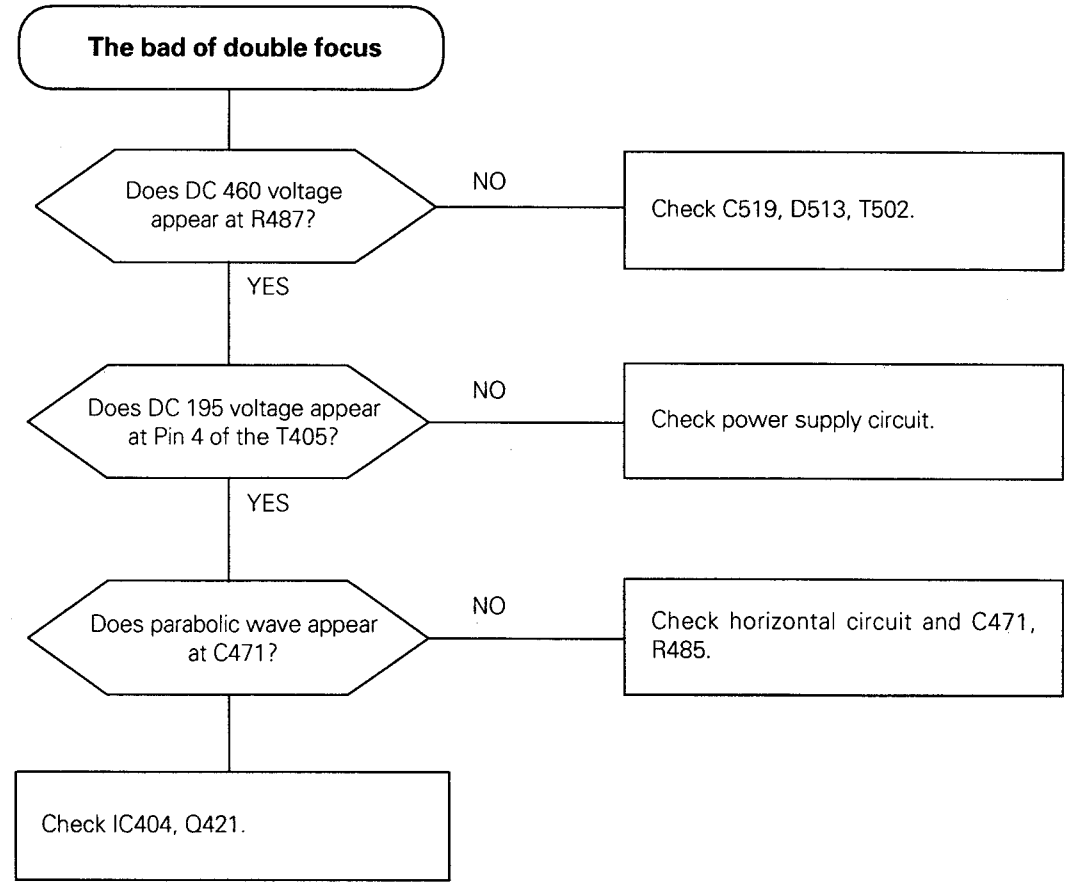

Color purity failure
Check the connector CN602 on degaussing circuit, if OK, Check PTH601, RL601, Q605.
Switch the display monitor ON or push manual degauss button and allow it to warm up for 30 minutes, then check the purity. If the purity is not improved, replace the CRT.

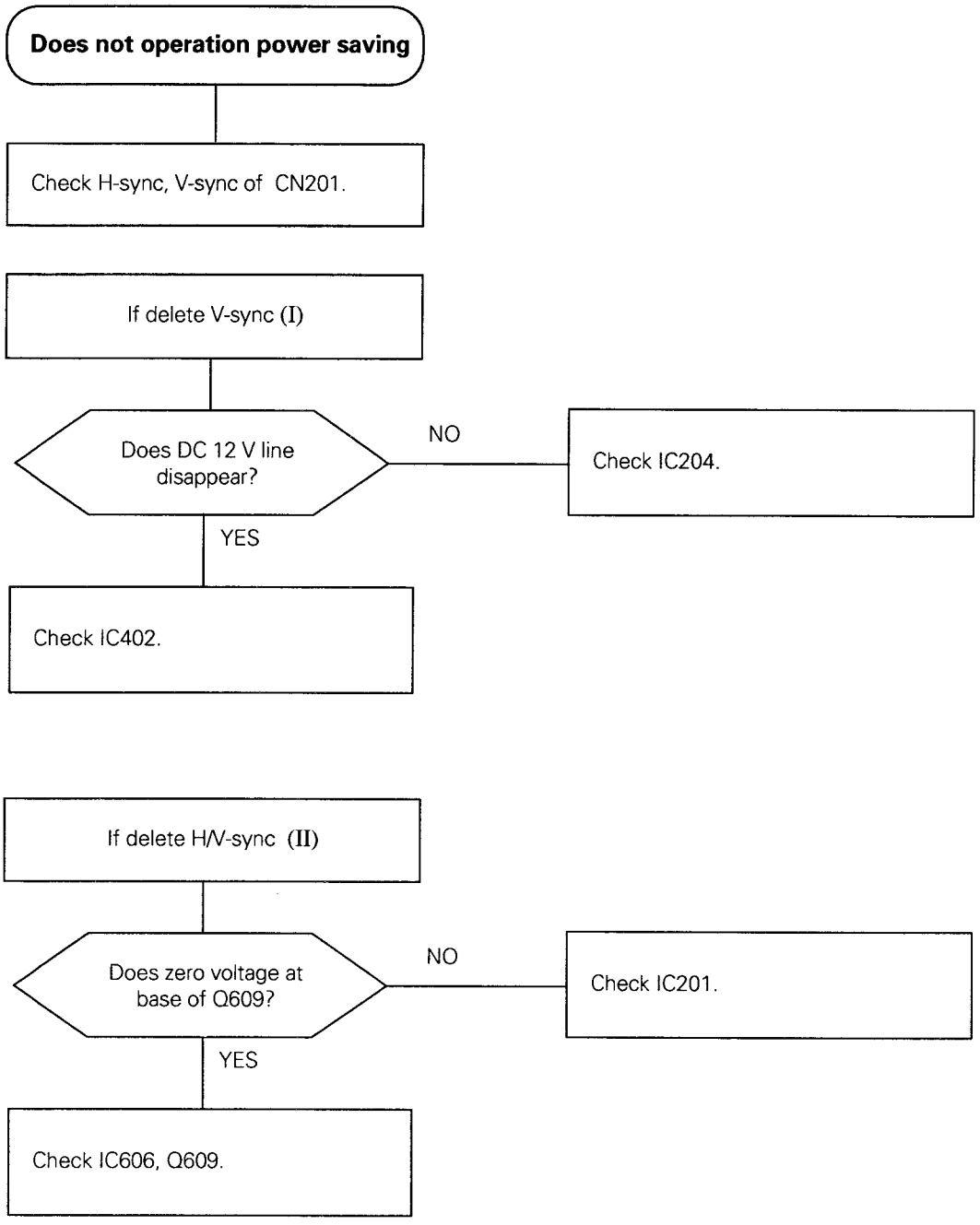
Note: If color purity is not normal, manual degaussing should be done by mandatory method using the manual degaussing coil before inspection.

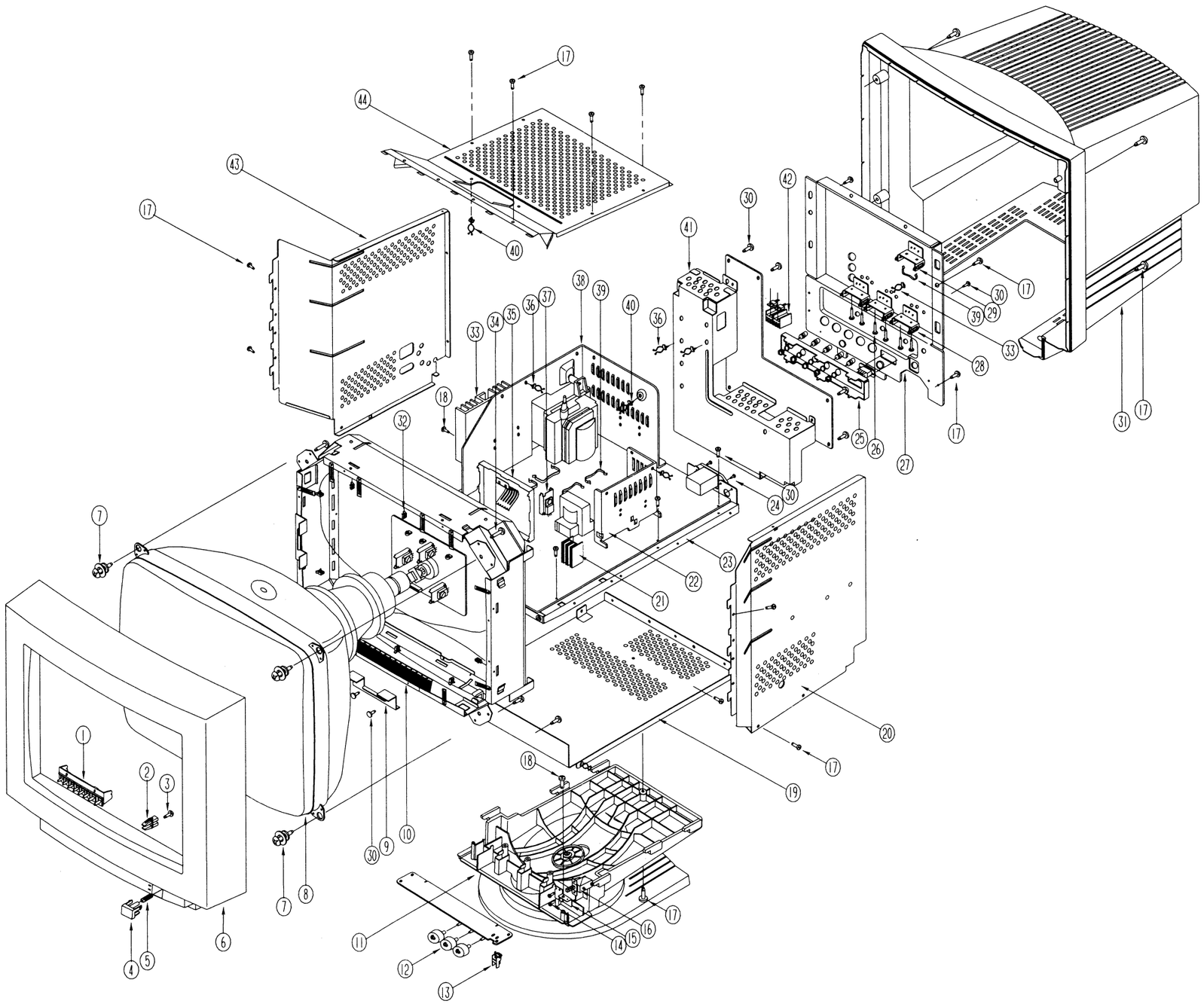

Don't operate Function key
Does the signal wave of CN203 appear when the function button press?
NO
Replace the CN203.
YES
Check tact switch, IC201.


No operate H-phase function
Does DC voltage between 1 V and 12 V appear at Pin 14 of IC203?
NO
Check IC203.
YES
Does DC 5 V, 12 V appear at Pin 5 of IC401 and Pin 3 of IC402?
NO
Check IC204 power supply circuit.
YES
Check IC401, IC402, Q401, Q424, Q425 and its related circuits.


No operate side pin and trapezoid function
Does DC level appear Pin 18, 19 of IC203?
NO
Check IC203.
YES
Does ramp wave and parabolic wave at Pin 1, Pin 14 of IC701?
NO
Check C707, C710, IC402, IC701.
YES
Check C711.


The bad of double focus
Does DC 460 voltage appear at R487?
NO
Check C519, D513, T502.
YES
Does DC 195 voltage appear at Pin 4 of the T405?
NO
Check power supply circuit.
YES
Does parabolic wave appear at C471?
NO
Check horizontal circuit and C471, R485.
Check IC404, Q421.


Does not operation power saving
Check H-sync, V-sync of CN201.
If delete V-sync (I)
Does DC 12 V line disappear?
NO
Check IC204.
YES
Check IC402.
If delete H/V-sync (II)
Does zero voltage at base of Q609?
NO
Check IC201.
YES
Check IC606, Q609.



EXPLODED VIEW AND PARTS LIST

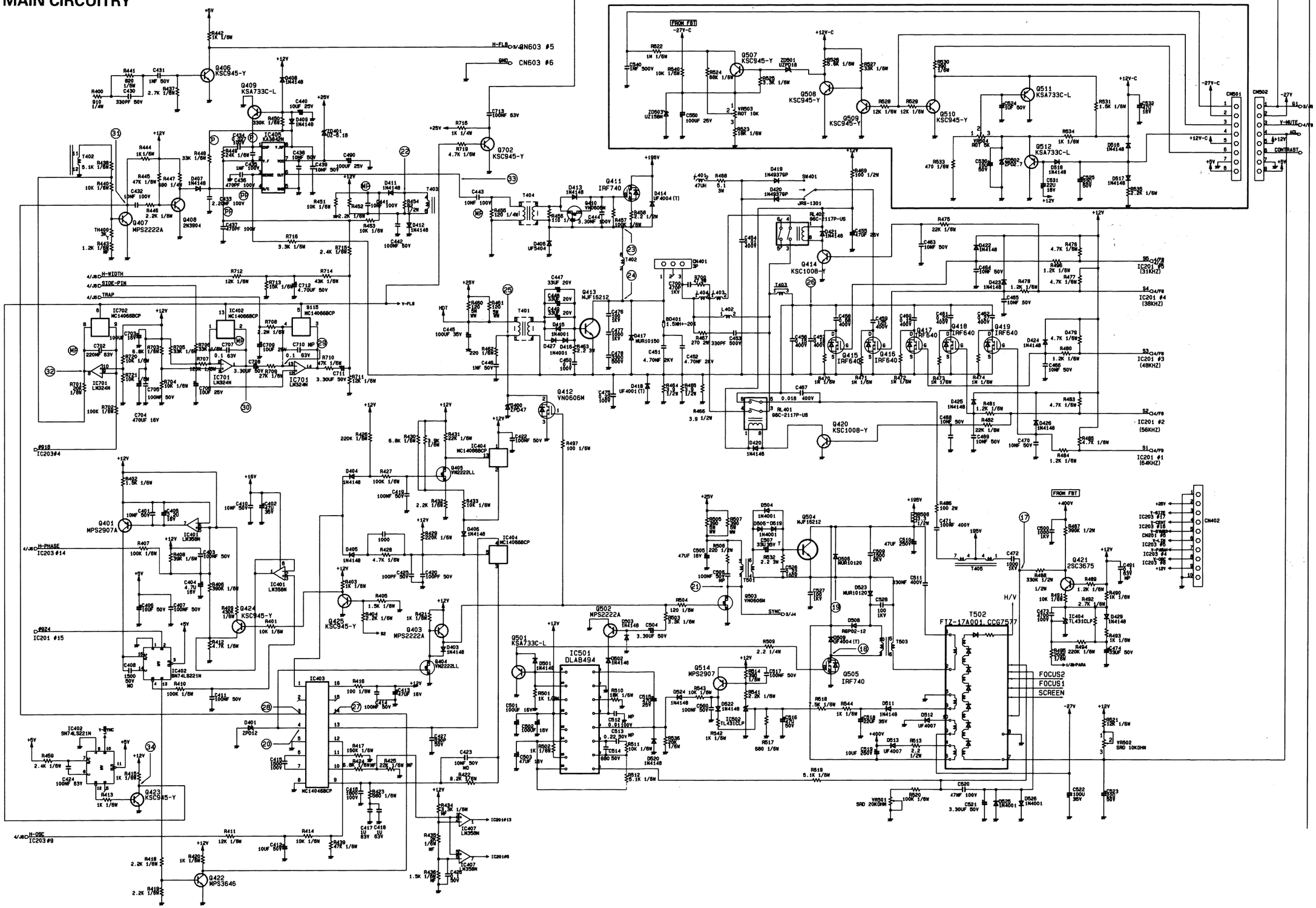
NO	DESCRIPTION	CODE NO.	SPECIFICATION	Q'TY	REMARK
1	KONB FUNCTION	821 469101AA	PC+ABS VB1108RS C7262	1	
2	LES LED	821 468252AA	ACRYL NTR CLEAR	1	
3	SCREW TAPTITE, BH	847 501007EG	B,BH+,M3,L8,YEL	1	
4	KNOB POWER	821 469099AA	PC+ABS VB1108RS C7262	1	
5	SPRING POWER	831 522033AD	SPS-2 T0.5	1	
6	COVER FRONT	821 460336AA	PC+ABS VB1108RS C7262	1	
7	SCREW CRT	847 502004BB	B,BH+,M5,L25,W/W,YEL	4	
8	20" COLOR CDT	997 250169AA	M48KFH180X19(U) 0.28 D/P AR	1	
9	BRKT GUIDE	813 460279AA	SECC,P T1.0	2	
10	ASS'Y CHASSIS	811 466025AA	SECC,P T1.2	1	
11	ASS'Y STAND	811 460048AA	PC+ABS VB1108RS C7262	1	
12	KNOB VR	831 171037DA	PC+ABS VB1108RS C7262	3	
13	HOLDER LED	953 310015AA	PP V0 BLACK	1	
14	SCREW MACHINE RH	841 413008BB	RH+,M3,L6,YEL	2	
15	BRKT POWER	813 460268AA	SECC,P T1.0	1	
16	POWER S/W	03529-705-010	SWITCH-PUSH,BUTTON,SPST	1	
17	SCREW TAPTITE, BH	847 501007FA	S,BH+,M4,L10,YEL	23	
18	SCREW TAPTITE, BH	847 501007FB	B,BH+,M4,L12,YEL	1	
19	CHASSIS BOTTOM	813 466085AA	SECC,P T1.2	1	
20	SHIELD RIGHT	815 464101AA	SECC,P T1.0	1	
21	HEAT-SINK TR	831 511012AC	A6063(S) EXTR	1	
22	HEAT-SINK POWER	831 513525AA	A1050S H14 T2.0	1	
23	FRAME MAIN PCB	813 460271AA	SECC,P T1.0	1	
24	SCREW TAPPING, FH	842 243013AC	FH+,M3,L6,BLACK	2	
25	BRKT BNC	813 460276AA	SPC-1 T0.5 FT2	1	
26	SCREW TAPTITE BH	847 501007EF	B,BH+,M3,L16,W/W,YEL	6	
27	SHIELD REAR	815 464104AA	A1050S H14 T2.0	1	
28	HEAT SINK VIDEO	831 515032AA	A1050S H14 T2.0	3	
29	HEAT SINK VIDEO	831 515032AB	A1050S H14 T2.0	1	
30	SCREW TAPTITE BH	847 502005AA	B,BH+,M3,L10,W/W,YEL	33	

EXPLODED VIEW AND PARTS LIST

NO.	DESCRIPTION	CODE NO.	SPECIFICATION	Q'TY	REMARK
31	COVER REAR	821 460331AA	PC+ABS VB1108RS C7262	1	
32	HOLDER D.G COIL	857 170036AA	NATURAL, NYLON 6/6	10	
33	HEAT-SINK MAIN(S)	831 512009BA	S7-74(S) EXTR	1	
34	SCREW TAPTITE BH	847 501007FC	B,BH+,M4,L16,YEL	4	
35	SHIELD CRT PCB	813 464190AA	SPTE T0.2	1	
36	HOLDER WIRE	857 170035A3	NATURAL, NYLON 6/6	7	
37	HEAT SINK TR	831 513023AA	SPCC T1.0 SN	1	
38	HEAT SINK MAIN	831 513031AA	A1050S H14 T2.0	1	
39	SPRING TR	813 468062AC	SUS 304-1 T0.5	5	
40	HOLDER WIRE	857 170035AF	NATURAL,NYLON 6/6	2	
41	SHIELD VIDEO	813 464203AA	SECC,P T0.8	1	
42	HEAT SINK REGU.	831 511006AC	A6063(S) EXTR BLACK	2	
43	SHIELD LEFT	815 464102AA	SECC,P T1.0	1	
44	SHIELD TOP	815 464103AA	A1050S H14 T0.5	1	

SCHEMATIC DIAGRAM

MAIN CIRCUITRY



12-1

12-2

SCHEMATIC DIAGRAM

CFG963* POWER CIRCUITRY

POWER CIRCUITRY

WARNING: BEFORE SERVICING THIS CHASSIS. READ"X-RAY RADIATION PRECAUTION, SAFETY PRECAUTION, PRODUCT SAFETY NOTICE".

1.THE SHADED AREAS AND MARKS ION THE SCHAMATIC

CAUTION

1.THE SHADED AREAS OR ⚠ MARKS IN THE SCHEMATIC DIAGRAM AND THE PARTS LIST DESIGNATE COMPONENTS WHICH HAVE SPECIAL CHARACTERISTICS IMPORTANT FOR SAFETY AND SHOULD BE REPLACED ONLY WITH TYPES IDENTICAL TO THOSE IN THE ORIGINAL CIRCUIT OR SPECIFIED IN THE PARTS LIST.BEFORE RE-PLACING ANY OF THIS COMPONENTS. READ CAREFULLY THE "PRODUCT SAFETY NOTICE".

2.DURING A NUMEROUS MEASUREMENT OF THIS MONITOR MATTERS THAT DEMAND SPECIAL ATTENTION IS FOLLOWING
1) DO NOT USE YOUR INSTRUMENT BETWEEN PRIMARY GROUND (SYMBOL ⏚) AND SECONDARY CIRCUIT
2) DO NOT USE YOUR INSTRUMENT BETWEEN SECONDARY GROUND (SYMBOL ⏚) AND PRIMARY CIRCUIT.

3.THE SHADED AREAS ARE PRIMARY SECTION (HOT PART)

WARNING: "THIS EQUIPMENT CONTAINS SAFETY CRITICAL COMPONENTS ALL PARTS SHOWN IN THE SHADED AREAS OF THE SCHEMATIC ARE SAFETY REPLACE SAFETY CRITICAL COMPONENTS ONLY WITH MAUNFACTURERS RECOMMANDED PARTS LIST FOR EXACT REPLACEMENTS."

NOTE

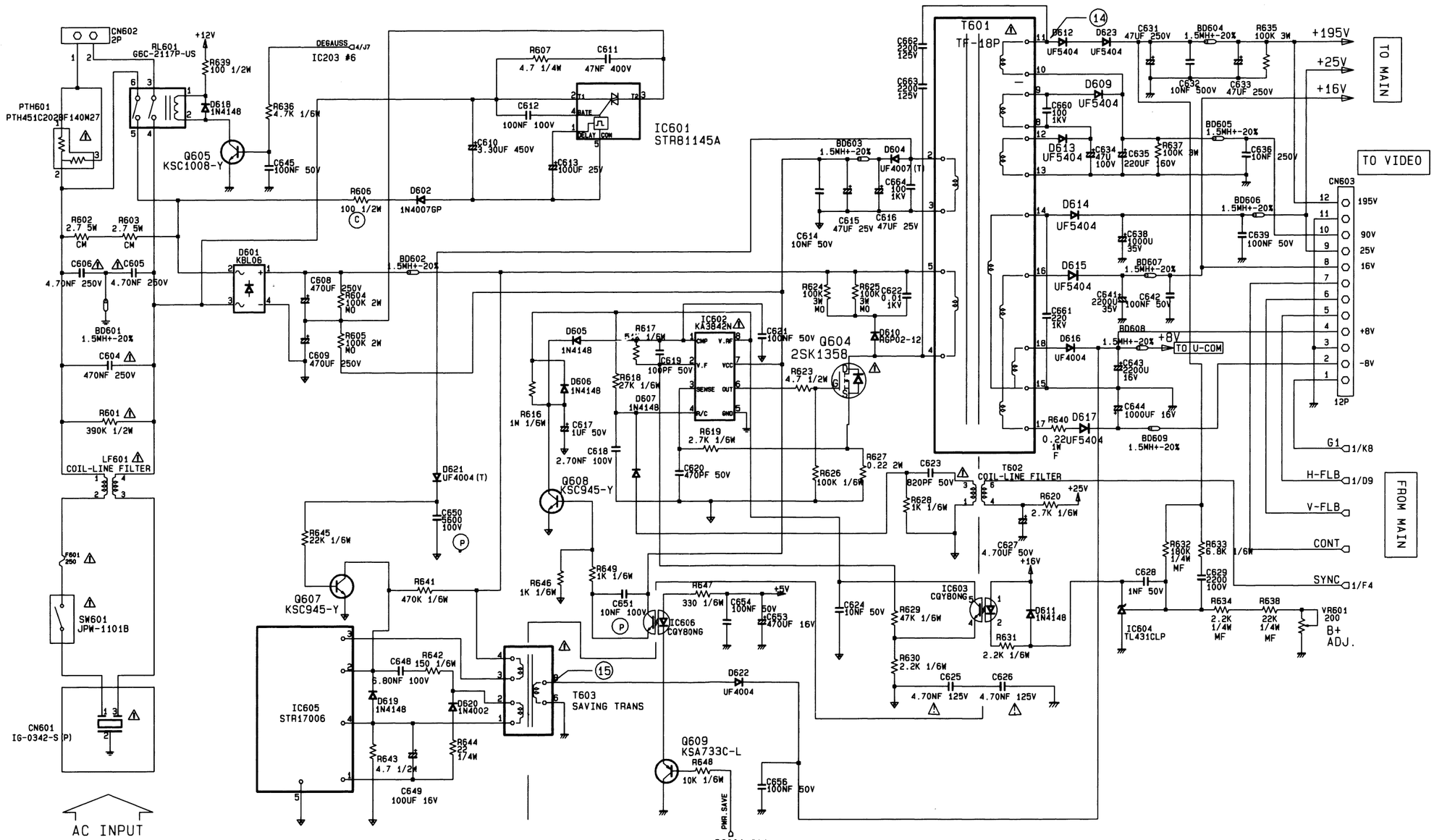
1.RESISTANCE IS SHOWN IN OHM K=1000, M=1000000. RATED POWER OF RESISTOR NOT NOTED IN SCHEMATIC DIAGRAM IS 1/4W
2.CAPACITANCE IS SHOWN UF AND NOT NOTED CAPACITANCES IS SHOWN PF, 1UF=1000000PF. RATED VOLTAGE OF CONDENCER NOT NOTED IN SCHEMATIC DIAGRAM IS 50V.
3.ABBREVIATION AND SYMBOL

MO: R-METAL OXIDE
WW: R-WIRE WOUND
F: R-FUSIBLE
C: R-COMPOSITION
CM: R-CEMENT
POLY: C-POLYESTER
MC: C-MONOLYTIC
NPO: C-NPO
PP: C-POLYPROPYLENE
MP: C-M, POLYESTER
T: C-TANTALIUM
X: C-X7R

⏚ : PRIMARY GND ⏚ : SECONDARY GND

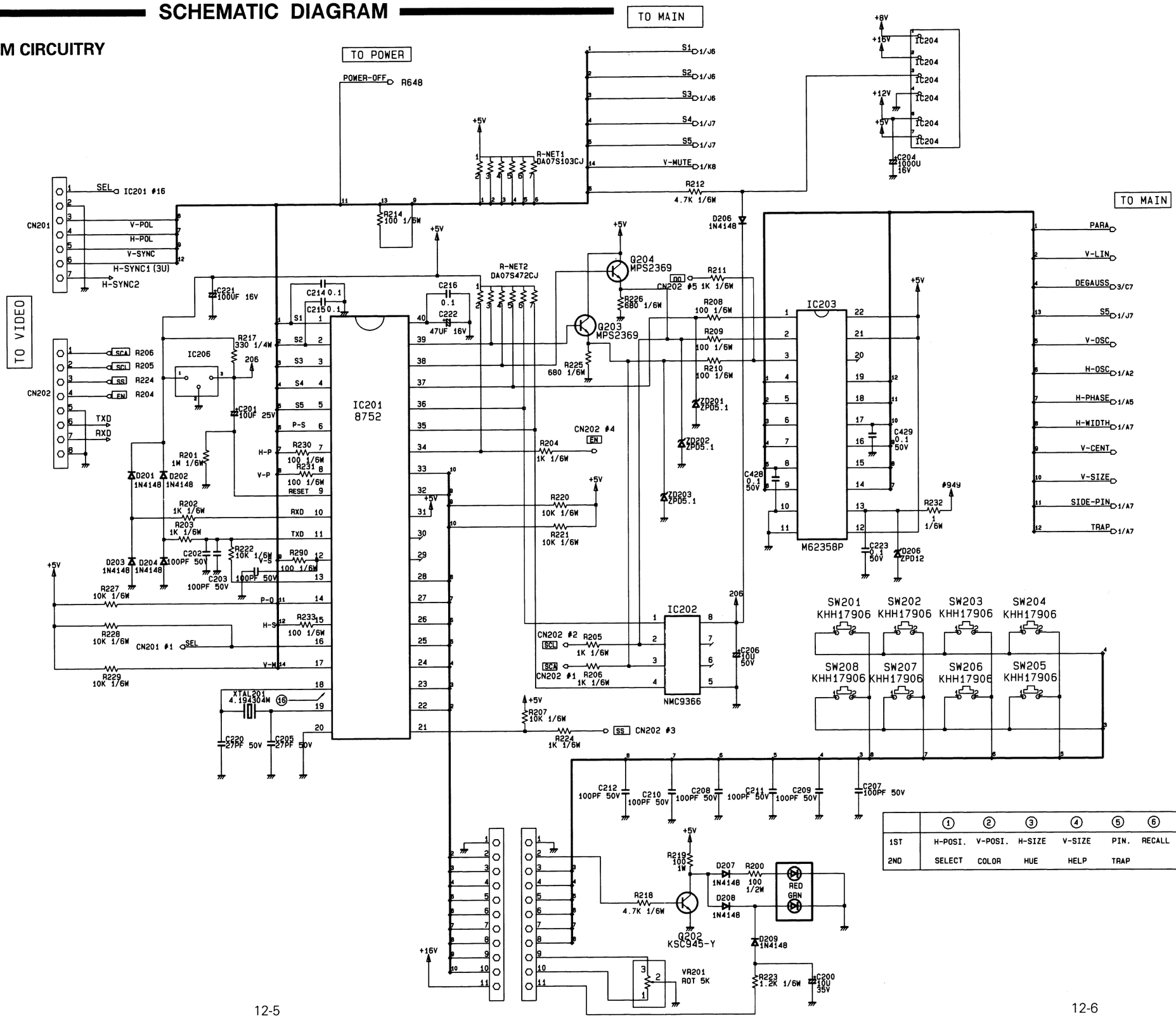
4.THE SECONDARY VOLTAGE IS READ WITH VTVM FROM INDICATED POINT TO SECONDARY GROUND (⏚). THE PRIMARY VOLTAGE IS READ WITH VTVM FROM INDICATED POINT TO PRIMARY GROUND (⏚).
5.THIS SCHEMATIC DIAGRAM IS SUBJECTED TO CHANGE WITHOUT NOTICE FOR FURTHER IMPROVEMENT.

AVERTISSMENT: "CE RECEPTEUR EST EQUIPE DE COMPOSANTS CRITIQUES POUR LA SECURITE TOUTESLES PIECES INDIQUEES DANS LES ZONES OMBREES DU SCHEMA SONT CRITIQUE POUR LA SECURITE POUR MAINTENIR LE DEGRE DE SECURITE DE LAPPAREIL NE REMPLACER LE FABRICANT DONT LE FONCTIONNEMENT EST CRITITE QUE PAR DES PIECES RECOMMANDEES PAR LE FABRICANT CONSULTER LA NOMENCLATURE DES PIECES POUR TROUVER LES PIECES DE RECHANGE EXACTES."



SCHEMATIC DIAGRAM

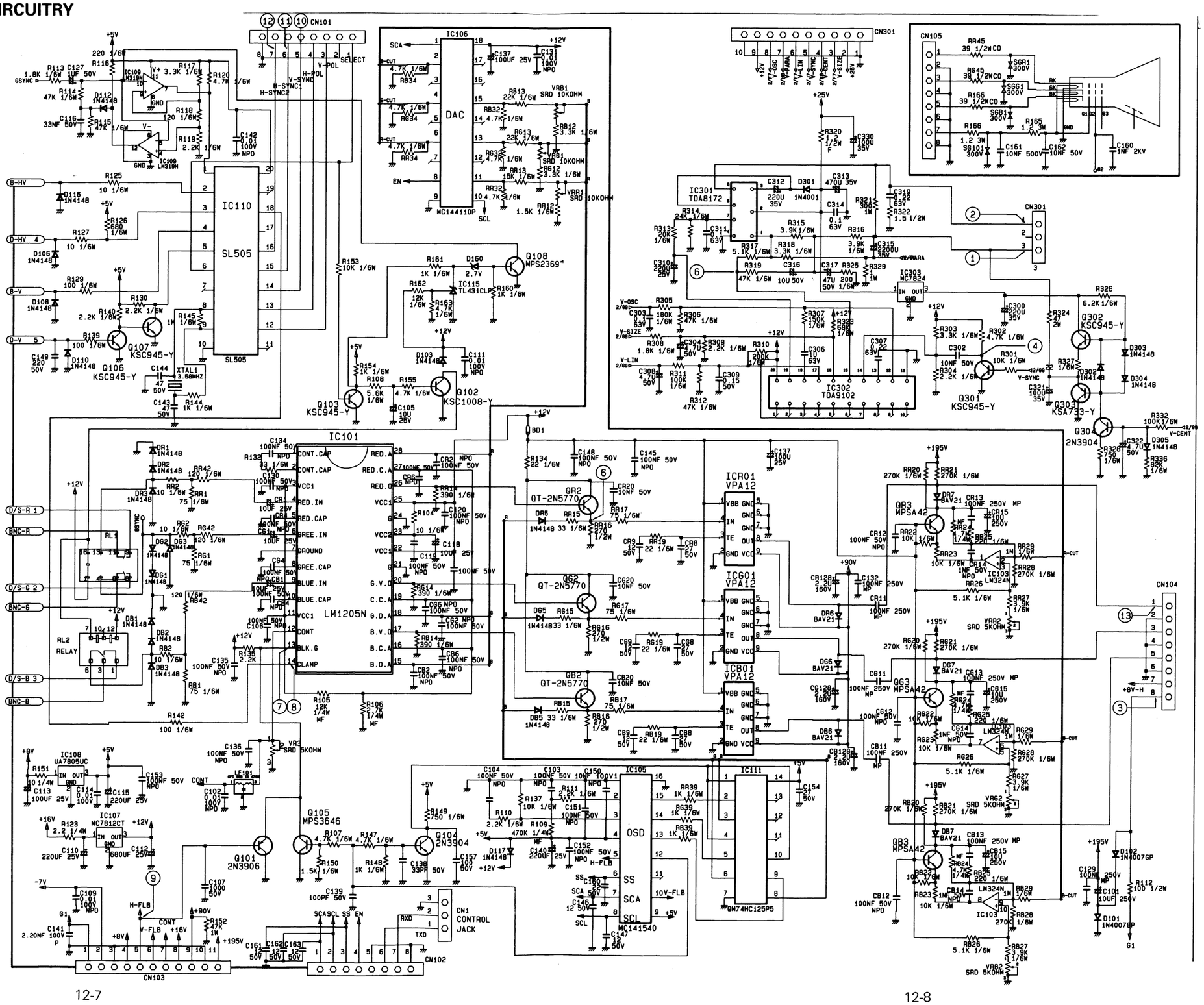
MICOM CIRCUITRY



	①	②	③	④	⑤	⑥	⑦	⑧
1ST	H-POSI.	V-POSI.	H-SIZE	V-SIZE	PIN.	RECALL	BNC/D-SUB	DEGAUSS
2ND	SELECT	COLOR	HUE	HELP	TRAP			

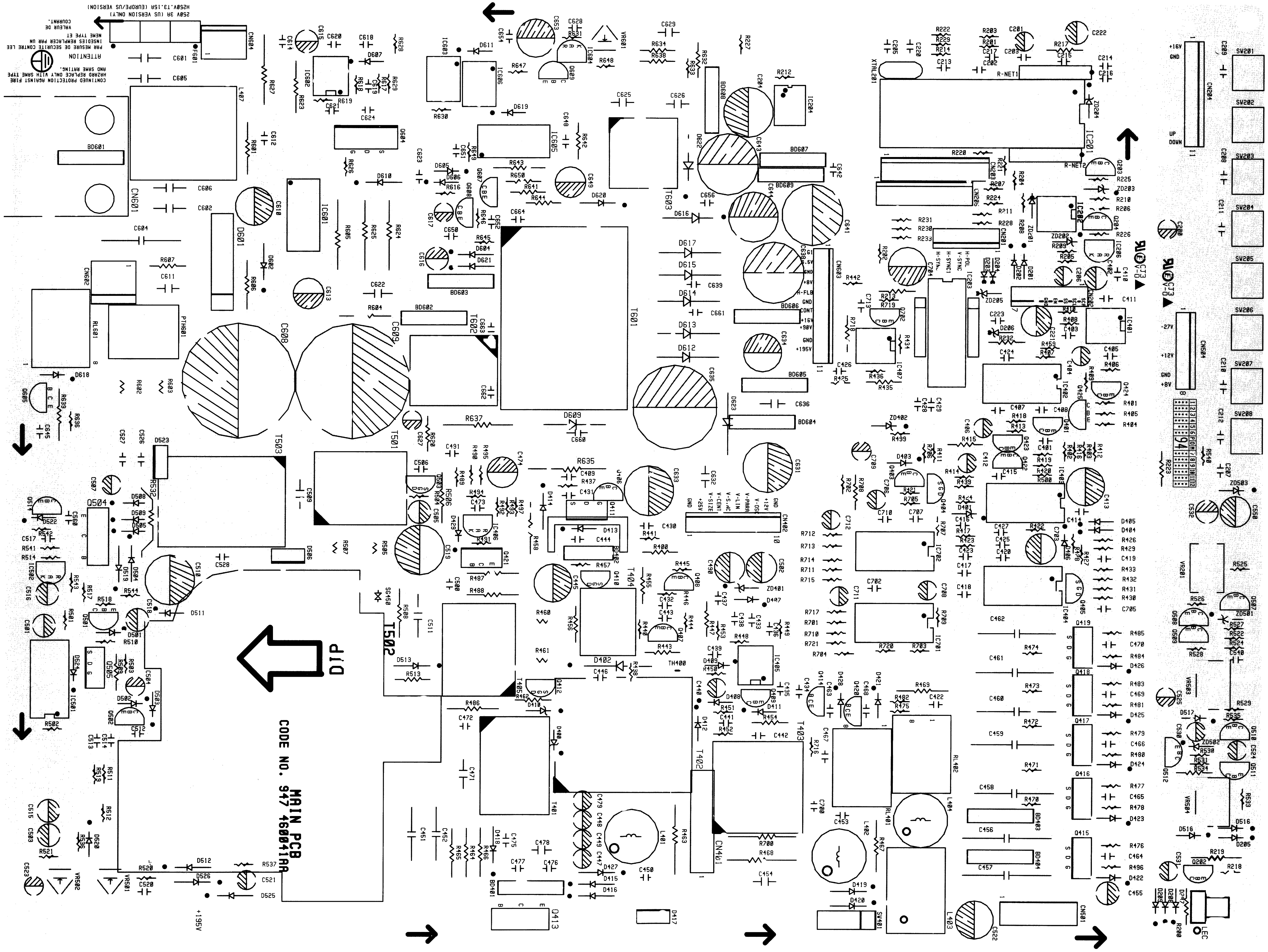
SCHEMATIC DIAGRAM

VIDEO & CRT CIRCUITRY



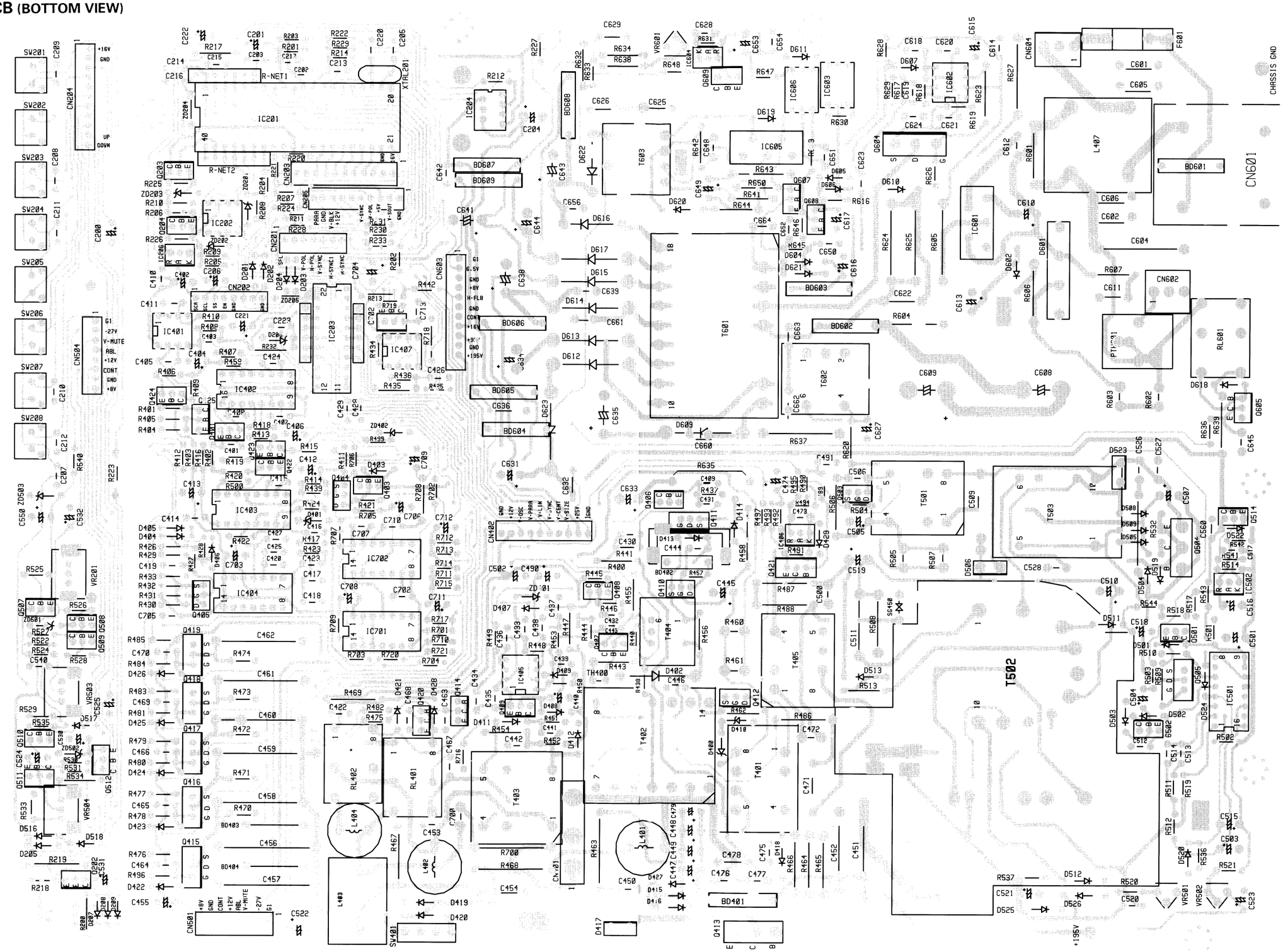
PRINTED CIRCUIT BOARD

MAIN PCB (TOP VIEW)


H250V.T3.15A (EUROPE/US VERSION)
250V 3A (US VERSION ONLY)
CONTINUED PROTECTION AGAINST FIRE HAZARD REPLACE ONLY WITH SAME TYPE AND SAME RATING.
ATTENTION
PAR MESURE DE SECURITE CONTRE LEE INSEDIES REMPLACER PAR UN NEME TYPE ET VALEUR DE COURANT.
DIP
MAIN PCB
CODE NO. 947 460041AA
+195V
GND +25V V-SIZE V-CENT V-S.NC V-LIN V-PARA V-OSC +12V GND
G1 6.5V GND +8V H-FLB GND CONT +16V +90V GND +195V
H-SYNC H-SYNC1 V-SYNC H-POL
+16V GND UP DOWN
-27V +12V GND +8V

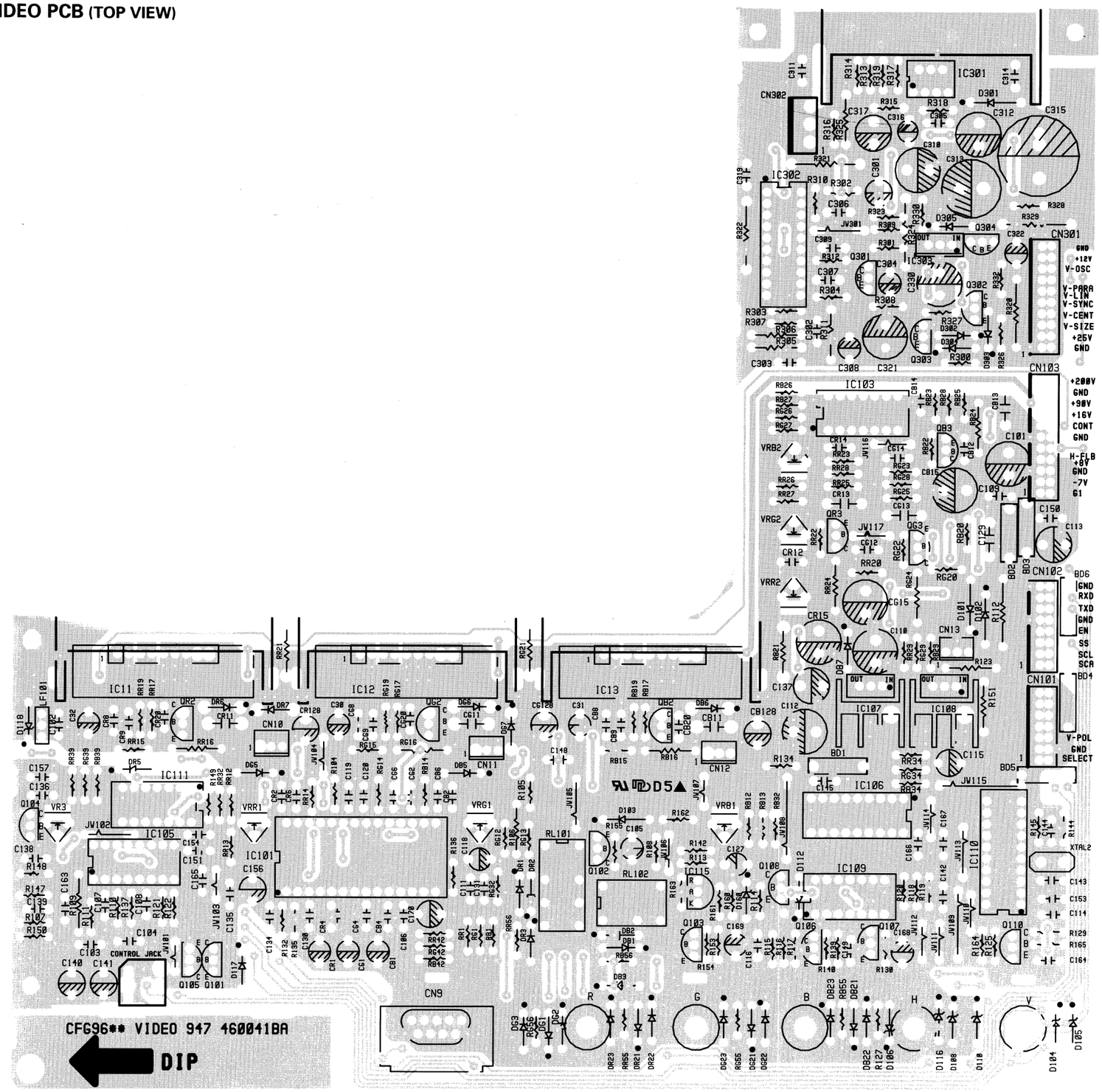
PRINTED CIRCUIT BOARD

MAIN PCB (BOTTOM VIEW)

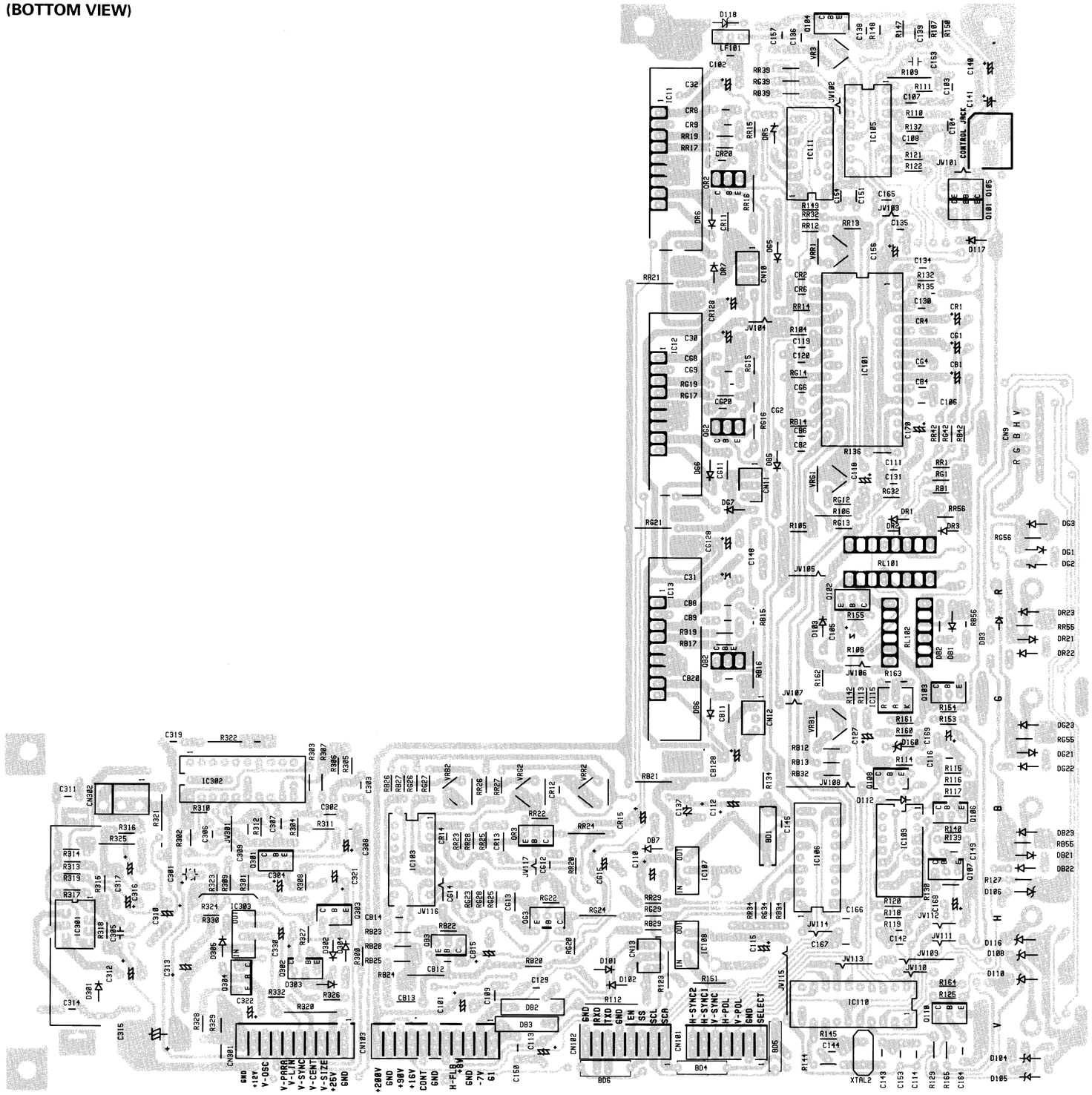


PRINTED CIRCUIT BOARD

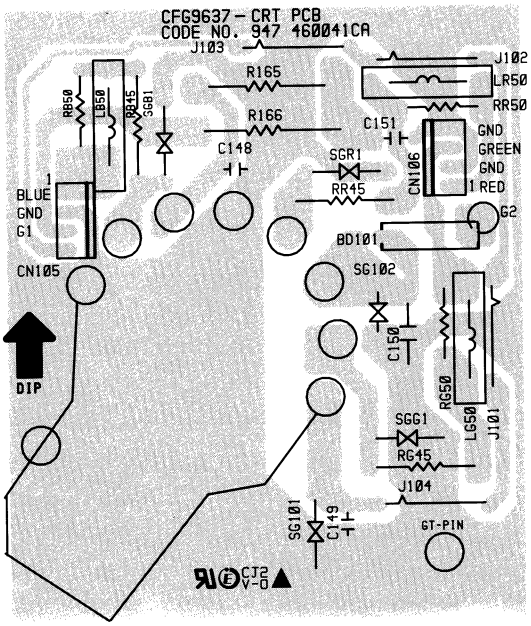
VIDEO PCB (TOP VIEW)



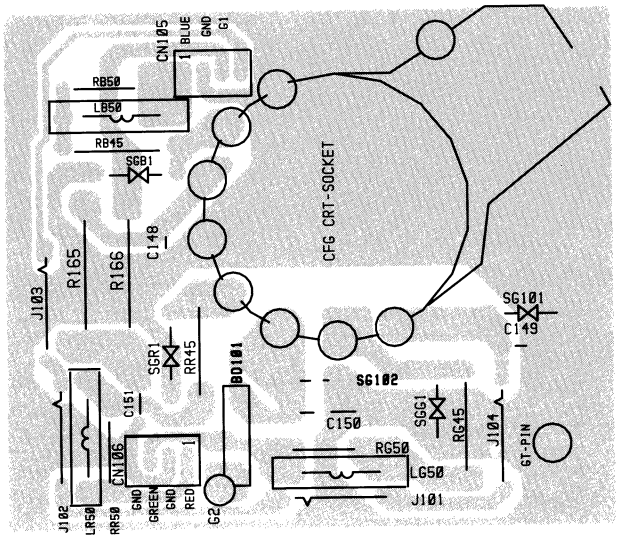
VIDEO PCB (BOTTOM VIEW)



CRT SOCKET PCB (TOP VIEW)



CRT SOCKET PCB (BOTTOM VIEW)



ELECTRICAL PARTS LIST

IMPORTANT SAFETY NOTICE

Component identified by the symbol ⚠ have special characteristic important to safety. When replacing any of these components, use only manufacturer's specified parts.

NOTE

- Tolerance : F; ±1%, J; ±5%, K; ±10%, M; ±20%, P; +100~0%, Z;+80~-20%
- Rated Voltage

  0J: 6.3V, 1A:10V, 1C:16V, 1D:20V, 1E:25V, 1F:35V, 1G:40V, 1H:50V, 1J:63V, 1K:75V, 2A:100V, 2B:125V, 2C:160V, 2D:200V, 2E:250V, 2V:350V, 2G:400V, 2W:450V, 2H:500V, 2J:630V, 3A:1KV, 3C:1.6KV, 3D:2KV.

LOC. NO	DESCRIPTION	CODE NO	REMARK
MAIN PCB PARTS			
	FERRITE-CORES		
BA600	FERRITE-CORE: 1.2MH+-20%	937 120211AA	
BD401	FERRITE-CORE:1.5MH+-20%	02429-048-017	
BD405	FERRITE-CORE: 1.2MH+-20%	937 120211AA	
BD406	FERRITE-CORE: 1.2MH+-20%	937 120211AA	
BD407	FERRITE-CORE: 1.2MH+-20%	937 120211AA	
BD408	FERRITE-CORE: 1.2MH+-20%	937 120211AA	
BD409	FERRITE-CORE: 1.2MH+-20%	937 120211AA	
BD601	FERRITE-CORE:1.5MH+-20%	02429-048-017	
BD602	FERRITE-CORE:1.5MH+-20%	02429-048-017	
BD603	FERRITE-CORE:1.5MH+-20%	02429-048-017	
BD604	FERRITE-CORE:1.5MH+-20%	02429-048-017	
BD605	FERRITE-CORE:1.5MH+-20%	02429-048-017	
BD606	FERRITE-CORE:1.5MH+-20%	02429-048-017	
BD607	FERRITE-CORE:1.5MH+-20%	02429-048-017	
BD608	FERRITE-CORE:1.5MH+-20%	02429-048-017	
BD609	FERRITE-CORE:1.5MH+-20%	02429-048-017	
	CAPACITORS		
C200	CAP-AL.ELEC,106M,1H	917 122100HM	
C201	CAP-AL.ELEC,106M,1E	917 122100EM	
C202	CAP-CERAMIC,101J,1H,SL	915 313100HJHH	
C203	CAP-CERAMIC,101J,1H,SL	915 313100HJHH	
C204	CAP-AL.ELEC,108M,1C,105C	917 744100CM	
C205	CAP-CERAMIC,270J,1H,NPO	915 312270HJXH	
C206	CAP-AL.ELEC,106M,1H	917 122100HM	

LOC. NO	DESCRIPTION	CODE NO	REMARK
C207	CAP-CERAMIC,101J,1H,SL	915 313100HJHH	
C208	CAP-CERAMIC,101J,1H,SL	915 313100HJHH	
C209	CAP-CERAMIC,101J,1H,SL	915 313100HJHH	
C210	CAP-CERAMIC,101J,1H,SL	915 313100HJHH	
C211	CAP-CERAMIC,101J,1H,SL	915 313100HJHH	
C212	CAP-CERAMIC,101J,1H,SL	915 313100HJHH	
C213	CAP-CERAMIC,101J,1H,SL	915 313100HJHH	
C214	CAP-CERAMIC,104J,1H,MONO	915 266100HJXH	
C215	CAP-CERAMIC,104J,1H,MONO	915 266100HJXH	
C216	CAP-CERAMIC,104J,1H,MONO	915 266100HJXH	
C220	CAP-CERAMIC,270J,1H,NPO	915 312270HJXH	
C221	CAP-AL.ELEC,107M,1C	917 123100CM	
C222	CAP-AL.ELEC,476M,1C	917 122470CM	
C223	CAP-CERAMIC,104Z,1H,Y5V	915 336100HZVH	
C401	CAP-CERAMIC,103Z,1H,Y5V	915 325100HZVH	
C402	CAP-AL.ELEC,476M,1E	917 122470EM	
C403	CAP-CERAMIC,104Z,1H,Y5V	915 336100HZVH	
C404	CAP-AL.ELEC,475M,1H	917 121470HM	
C405	CAP-MPETP,104J,1J,5P	916 566100JJAH	
C406	CAP-AL.ELEC,106M,1H	917 122100HM	
C407	CAP-CERAMIC,104Z,1H,Y5V	915 336100HZVH	
C408	CAP-CERAMIC,102J,2A,MONO	915 164100LJXH	
C410	CAP-CERAMIC,103Z,1H,Y5V	915 325100HZVH	
C411	CAP-CERAMIC,104K,2A,MONO	915 266100LKXH	
C412	CAP-AL.ELEC,106M,1H	917 122100HM	
C413	CAP-AL.ELEC,477M,1C	917 123470CM	
C414	CAP-CERAMIC,104Z,1H,Y5V	915 336100HZVH	
C415	CAP-PE/PPF,152J,1H	916 934150HJAH	
C416	CAP-CERAMIC,333K,2A,X7R	915 265330LKXXNA	
C417	CAP-MPETP,105K,1J,5P	916 567100JKAH	
C418	CAP-MPETP,105K,1J,5P	916 567100JKAH	
C419	CAP-CERAMIC,104Z,1H,Y5V	915 336100HZVH	
C422	CAP-CERAMIC,104Z,1H,Y5V	915 336100HZVH	
C424	CAP-CERAMIC,104K,2A,MONO	915 266100LKXH	
C425	CAP-CERAMIC,101J,1H,SL	915 313100HJHH	
C426	CAP-CERAMIC,104K,2A,MONO	915 266100LKXH	
C427	CAP-CERAMIC,102J,2A,MONO	915 164100LJXH	
C428	CAP-CERAMIC,104Z,1H,Y5V	915 336100HZVH	
C429	CAP-CERAMIC,104Z,1H,Y5V	915 336100HZVH	
C430	CAP-CERAMIC,331J,1H,SL	915 313330HJHH	
C431	CAP-CERAMIC,102K,1H,Y5P	915 324100HKPH	
C432	CAP-CERAMIC,103J,2A,MONO	915 265100LJXH	
C433	CAP-PPF,222J,2A,5.08	916 364220LJAH	
C434	CAP-MYLAR,103J,2A,5P	916 165100LJAH	

LOC. NO	DESCRIPTION	CODE NO	REMARK
C435	CAP-CERAMIC,821K,1H,Y5P	915 323820HKPH	
C436	CAP-CERAMIC,471J,2A,MONO	915 163470LJXH	
C437	CAP-CERAMIC,471J,2A,MONO	915 163470LJXH	
C438	CAP-CERAMIC,103Z,1H,Y5V	915 325100HZVH	
C439	CAP-CERAMIC,103Z,1H,Y5V	915 325100HZVH	
C440	CAP-AL.ELEC,106M,1E	917 122100EM	
C441	CAP-CERAMIC,103J,2A,MONO	915 265100LJXH	
C442	CAP-CERAMIC,104Z,1H,Y5V	915 336100HZVH	
C443	CAP-CERAMIC,103J,2A,MONO	915 265100LJXH	
C444	CAP-MYLAR,332J,2A,5P	916 164330LJAH	
C445	CAP-AL.ELEC,107M,1V,105C	917 743100FM	
C446	CAP-CERAMIC,102J,2A,MONO	915 164100LJXH	
C447	CAP-TANTAL,336K,1D	917 312330DK	
C448	CAP-TANTAL,336K,1D	917 312330DK	
C449	CAP-TANTAL,336K,1D	917 312330DK	
C450	CAP-CERAMIC,104K,2A,MONO	915 266100LKXH	
C451	CAP-MPE/PP,252J,3C,17.5P	916 944250YJAX	
C452	CAP-PPF,222J,3C	916 354220YJAX	
C453	CAP-CERAMIC,331K,2H,Y5P	915 323330VKPH	
C454	CAP-PPF,153J,2J,15.2P	916 355150WJAX	
C455	CAP-AL.ELEC,476M,1E	917 122470EM	
C456	CAP-PPF,154J,2G,20P	916 356150TJAX	
C457	CAP-MPPF,184J,2G,15P	916 656180TJAX	
C458	CAP-MPPF,684J,2G,25P	916 656680TJAX	
C459	CAP-MPPF,125J,2G,25P	916 657120TJAX	
C460	CAP-MPPF,154J,2G	916 656150TJAX	
C461	CAP-PPF,224J,2G	916 356220TJAX	
C462	CAP-MPPF,274J,2G	916 656270TJAX	
C463	CAP-CERAMIC,103Z,1H,Y5V	915 325100HZVH	
C464	CAP-CERAMIC,103Z,1H,Y5V	915 325100HZVH	
C465	CAP-CERAMIC,103Z,1H,Y5V	915 325100HZVH	
C466	CAP-CERAMIC,103Z,1H,Y5V	915 325100HZVH	
C467	CAP-PPF,183J,2G	916 355180TJAX	
C468	CAP-CERAMIC,103Z,1H,Y5V	915 325100HZVH	
C469	CAP-CERAMIC,103Z,1H,Y5V	915 325100HZVH	
C470	CAP-CERAMIC,103Z,1H,Y5V	915 325100HZVH	
C471	CAP-MPPF,104J,2G,12.5P	916 656100TJAX	
C472	CAP-CERAMIC,102K,3A,DISC	915 324100XKPH	
C473	CAP-MYLAR,472J,2A,5P	916 164470LJAH	
C474	CAP-AL.ELEC,336M,1H	917 122330HM	
C475	CAP-MPETP,224K,1J,5P	916 566220JKAH	
C476	CAP-CERAMIC,101K,3D,Y5P	915 323100YKPX	
C477	CAP-CERAMIC,102K,3A,DISC	915 324100XKPH	
C478	CAP-CERAMIC,332K,2H,Y5P	915 324330VKPX	

LOC. NO	DESCRIPTION	CODE NO	REMARK
C490	CAP-AL.ELEC,107M,1E	917 123100EM	
C491	CAP-CERAMIC,104Z,1H,Y5V	915 336100HZVH	
C500	CAP-CERAMIC,102K,3A,DISC	915 324100XKPH	
C501	CAP-AL.ELEC,107M,1C	917 123100CM	
C502	CAP-AL.ELEC,107M,1C	917 123100CM	
C503	CAP-AL.ELEC,476M,1C	917 122470CM	
C504	CAP-AL.ELEC,335M,1H	917 121330HM	
C505	CAP-AL.ELEC,476M,1C,105C	917 742470CM	
C506	CAP-MPETP,104J,1J,5P	916 566100JJAH	
C507	CAP-TANTAL,336K,1D	917 312330DK	
C509	CAP-MPE/PPF,152J,3D,15P	916 944150ZJAX	
C510	CAP-AL.ELEC,476M,2E,105C	917 872470QM	
C511	CAP-MPPF,334J,2G	916 656330TJAX	
C512	CAP-MPETP,103K,2A,5P	916 565100LKAH	
C513	CAP-MPETP,224K,1J,5P	916 566220JKAH	
C514	CAP-CERAMIC,681K,1H,Y5P	915 323680HKPH	
C515	CAP-AL.ELEC,476M,1E,105'C	917 742470EM	
C516	CAP-AL.ELEC,226M,1E	917 122220EM	
C517	CAP-CERAMIC,103Z,1H,Y5V	915 325100HZVH	
C518	CAP-AL.ELEC,226M,1V	917 122220FM	
C519	CAP-AL.ELE,106M,2E,10X20	917 742100QM	
C520	CAP-MPETP,473K,2A,5P	916 565470LKAH	
C521	CAP-AL.ELEC,335M,1H	917 121330HM	
C522	CAP-AL.ELEC,107M,1V	17 123100FM	
C523	CAP-AL.ELEC,226M,1E	917 122220EM	
C524	CAP-AL.ELEC,105M,1H	17 121100HM	
C525	CAP-AL.ELEC,226M,1E	917 122220EM	
C526	CAP-MPETP,224K,1J,5P	916 566220JKAH	
C527	CAP-CERAMIC,101K,3A,Y5P	915 323100XKPH	
C528	CAP-CERAMIC,101K,3A,Y5P	915 323100XKPH	
C530	CAP-AL.ELEC,106M,1H	917 122100HM	
C531	CAP-AL.ELEC,226M,1E	917 122220EM	
C532	CAP-AL.ELEC,476M,1E	917 122470EM	
C540	CAP-CERAMIC,102K,2H,Y5P	915 324100VKPH	
C550	CAP-AL.ELEC,107M,1E	917 123100EM	
C560	CAP-CERAMIC,104J,1H,MONO	915 266100HJXH	
⚠ C604	CAP-MPAPER,474K,250VAC	918 146470QK	
⚠ C605	CAP-MPAPER,474K,250VAC	918 146470QK	
C608	CAP-AL.ELEC,477M,2E 105'C	917 793470QMAX	
C609	CAP-AL.ELEC,477M,2E 105'C	917 793470QMAX	
C610	CAP-AL.ELEC,335M,2W,105C	917 871330UM	
C611	CAP-MYLAR,473K,2G	916 165470TKAX	
C612	CAP-MYLAR,104J,2A,5P	916 166100LJAH	
C613	CAP-AL.ELEC,107M,1E	917 123100EM	

LOC. NO	DESCRIPTION	CODE NO	REMARK
C614	CAP-CERAMIC,103Z,1H,Y5V	915 325100HZVH	
C615	CAP-AL.ELEC,476M,1E	917 122470EM	
C616	CAP-AL.ELEC,476M,1E	917 122470EM	
C617	CAP-AL.ELEC,105M,1H	917 121100HM	
C618	CAP-PPF,272J,2A	916 354270LJAH	
C619	CAP-CERAMIC,101J,1H,SL	915 313100HJHH	
C620	CAP-CERAMIC,471J,2A,MONO	915 163470LJXH	
C621	CAP-CERAMIC,104Z,1H,Y5V	915 336100HZVH	
C622	CAP-CERAMIC,103K,3A,Y5P	915 325100XKPX	
C623	CAP-CERAMIC,821K,1H,Y5P	915 323820HKPH	
C624	CAP-CERAMIC,103Z,1H,Y5V	915 325100HZVH	
C625	CAP-CERAMIC,472M,2B,DISC	915 344470MMVH	
C626	CAP-CERAMIC,472M,2B,DISC	915 344470MMVH	
C627	CAP-AL.ELEC,475M,1H	917 121470HM	
C628	CAP-CERAMIC,102K,1H,Y5P	915 324100HKPH	
C629	CAP-CERAMIC,222K,2H,Y5P	915 324220VKPH	
C631	CAP-AL.ELEC,476M,2E,105C	917 872470QM	
C632	CAP-CERAMIC,103P,2H,Y5U	915 325100VPUX	
C633	CAP-AL.ELEC,476M,2E,105C	917 872470QM	
C634	CAP-AL.ELEC,476M,2A,105C	917 742470LM	
C635	CAP-AL.ELEC,227M,2C,105C	917 813220NM	
C636	CAP-MPETP,103J,2E	916 555100QJAX	
C638	CAP-AL.ELEC,108M,1V,105C	917 744100FM	
C639	CAP-CERAMIC,104Z,1H,Y5V	915 336100HZVH	
C641	CAP-AL.ELEC,108M,1V,105C	917 744100FM	
C642	CAP-CERAMIC,104Z,1H,Y5V	915 336100HZVH	
C643	CAP-AL.ELEC,228M,1C,105C	917 874220CMAH	
C644	CAP-AL.ELEC,108M,1C,105C	917 744100CM	
C645	CAP-CERAMIC,104Z,1H,Y5V	915 336100HZVH	
C648	CAP-MYLAR,682J,2A,5P	916 164680LJAH	
C649	CAP-AL.ELEC,107M,1C	917 123100CM	
C650	CAP-MYLAR,103J,2A,5P	916 165100LJAH	
C651	CAP-MYLAR,103J,2A,5P	916 165100LJAH	
C653	CAP-AL.ELEC,477M,1C,105C	917 743470CM	
C654	CAP-CERAMIC,104Z,1H,Y5V	915 336100HZVH	
C656	CAP-CERAMIC,104Z,1H,Y5V	915 336100HZVH	
C660	CAP-CERAMIC,101K,3A,Y5P	915 323100XKPH	
C661	CAP-CERAMIC,221K,3A,Y5P	915 323220XKPH	
C662	CAP-CERAMIC,102K,3A,DISC	915 324100XKPH	
C663	CAP-CERAMIC,102K,3A,DISC	915 324100XKPH	
C664	CAP-CERAMIC,101K,3A,Y5P	915 323100XKPH	
C700	CAP-CERAMIC,471K,3A,Y5P	915 323470XKPX	
C702	CAP-MPETP,224K,1J,5P	916 566220JKAH	

LOC. NO	DESCRIPTION	CODE NO.	REMARK
C703	CAP-AL.ELEC,107M,1C	917 123100CM	
C704	CAP-AL.ELEC,477M,1C	917 123470CM	
C705	CAP-CERAMIC,104Z,1H,Y5V	915 336100HZVH	
C706	CAP-AL.ELEC,106M,1E	917 122100EM	
C707	CAP-MPETP,104J,1J,5P	916 566100JJAH	
C708	CAP-AL.ELEC,335M,1H	917 121330HM	
C709	CAP-AL.ELEC,106M,1E	917 122100EM	
C710	CAP-MPETP,104J,1J,5P	916 566100JJAH	
C711	CAP-AL.ELEC,335M,1H	917 121330HM	
C712	CAP-AL.ELEC,475M,1H	917 121470HM	
C713	CAP-MPETP,104J,1J,5P	916 566100JJAH	
	CONNECTORS		
CN201	CBF-CONN ASSY, 300MM,7P	955 460531AAAA	
CN202	CBF-CONN ASSY, 300MM,8P	955 460529AAAA	
CN203	CBF-CONN ASSY, 350MM,11P	955 460532AAAA	
CN204	CBF-CONN ASSY, 100MM,11P	955 460533AAAA	
CN401	CON-NOWALL HEADER,3P,1R	935 220103TD	
CN402	CBF-CONN ASSY, 300MM,10P	955 460536AAAA	
CN501	CBF-CONN ASSY, 100MM,8P	955 460538AAAA	
CN504	CBF-CONN ASSY, 300MM,8P	955 460539AAAA	
⚠ CN601	FIL-LPF,EMI,250V,3A	943 150034BA	
CN602	CON-WALL HEADER,2P,7.92	935 240902DH	
CN603	CBF-CONN ASSY, 350MM,11P	955 460534AAAA	
CN604	CON-WALL HEADER,3P,3.96	935 240903DLSA	
	DIODES		
D201	DIODE-SIG,1N4148,DO-35	893 114148AANM	
D202	DIODE-SIG,1N4148,DO-35	893 114148AANM	
D203	DIODE-SIG,1N4148,DO-35	893 114148AANM	
D204	DIODE-SIG,1N4148,DO-35	893 114148AANM	
D205	DIODE-SIG,1N4148,DO-35	893 114148AANM	
D206	DIODE-ZEN,UZ-12BM,DO-35	893 290031BB	
D207	DIODE-SIG,1N4148,DO-35	893 114148AANM	
D208	DIODE-SIG,1N4148,DO-35	893 114148AANM	
D209	DIODE-SIG,1N4148,DO-35	893 114148AANM	
D400	DIODE-ZEN,RD47EB,DO-35	893 290030NA	
D402	DIODE-REC,UF5404,DO201AD	893 399044AA	
D403	DIODE-SIG,1N4148,DO-35	893 114148AANM	
D404	DIODE-SIG,1N4148,DO-35	893 114148AANM	

LOC. NO	DESCRIPTION	CODE NO.	REMARK
D405	DIODE-SIG,1N4148,DO-35	893 114148AANM	
D406	DIODE-SIG,1N4148,DO-35	893 114148AANM	
D407	DIODE-SIG,1N4148,DO-35	893 114148AANM	
D408	DIODE-SIG,1N4148,DO-35	893 114148AANM	
D409	DIODE-SIG,1N4148,DO-35	893 114148AANM	
D411	DIODE-SIG,1N4148,DO-35	893 114148AANM	
D412	DIODE-SIG,1N4148,DO-35	893 114148AANM	
D413	DIODE-SIG,1N4148,DO-35	893 114148AANM	
D414	DIODE-REC,UF4004,DO-41	893 394004AA	
D415	DIODE-REC,1N4001,DO-41	893 314001AANH	
D416	DIODE-REC,1N4001,DO-41	893 314001AANH	
D417	DIODE:MUR10150E	02169-205-180	
D418	DIODE-REC,UF4001,DO-41	893 394001AA	
D419	DIODE-REC,1N4937,DO-41	893 314937AB	
D420	DIODE-REC,1N4937,DO-41	893 314937AB	
D421	DIODE-SIG,1N4148,DO-35	893 114148AANM	
D422	DIODE-SIG,1N4148,DO-35	893 114148AANM	
D423	DIODE-SIG,1N4148,DO-35	893 114148AANM	
D424	DIODE-SIG,1N4148,DO-35	893 114148AANM	
D425	DIODE-SIG,1N4148,DO-35	893 114148AANM	
D426	DIODE-SIG,1N4148,DO-35	893 114148AANM	
D427	DIODE-REC,1N4001,DO-41	893 314001AANH	
D428	DIODE-SIG,1N4148,DO-35	893 114148AANM	
D429	DIODE-SIG,1N4148,DO-35	893 114148AANM	
D501	DIODE-SIG,1N4148,DO-35	893 114148AANM	
D502	DIODE-SIG,1N4148,DO-35	893 114148AANM	
D503	DIODE-SIG,1N4148,DO-35	893 114148AANM	
D504	DIODE-REC,1N4001,DO-41	893 314001AANH	
D505	DIODE-REC,1N4001,DO-41	893 314001AANH	
D506	DIODE:MUR10120E	02169-205-200	
D508	DIODE-REC,RGP02-12E,DO-41	893 399006AA	
D509	DIODE-REC,UF4004,DO-41	893 394004AA	
D511	DIODE-SIG,1N4148,DO-35	893 114148AANM	
D512	DIODE-REC,UF4007,DO-41	893 394007AA	
D513	DIODE-REC,UF4007,DO-41	893 394007AA	
D516	DIODE-SIG,1N4148,DO-35	893 114148AANM	
D517	DIODE-SIG,1N4148,DO-35	893 114148AANM	
D518	DIODE-SIG,1N4148,DO-35	893 114148AANM	
D519	DIODE-REC,1N4001,DO-41	893 314001AANH	
D520	DIODE-SIG,1N4148,DO-35	893 114148AANM	
D522	DIODE-SIG,1N4148,DO-35	893 114148AANM	
D523	DIODE:MUR10120E	02169-205-200	
D524	DIODE-SIG,1N4148,DO-35	893 114148AANM	

LOC. NO	DESCRIPTION	CODE NO.	REMARK
D525	DIODE-REC,1N4001,DO-41	893 314001AANH	
D526	DIODE-REC,1N4001,DO-41	893 314001AANH	
D601	DIODE-REC,KBL06,BRIDGE	893 399012AA	
D602	DIODE-REC,1N4007GP,DO-41	893 314007BA	
D604	DIODE-REC,UF4007,DO-41	893 394007AA	
D605	DIODE-SIG,1N4148,DO-35	893 114148AANM	
D606	DIODE-SIG,1N4148,DO-35	893 114148AANM	
D607	DIODE-SIG,1N4148,DO-35	893 114148AANM	
D609	DIODE-REC,UF5404,DO201AD	893 399044AA	
D610	DIODE-REC,RGP02-12E,DO-41	893 399006AA	
D611	DIODE-SIG,1N4148,DO-35	893 114148AANM	
D612	DIODE-REC,UF5404,DO201AD	893 399044AA	
D613	DIODE-REC,UF5404,DO201AD	893 399044AA	
D614	DIODE-REC,UF5404,DO201AD	893 399044AA	
D615	DIODE-REC,UF5404,DO201AD	893 399044AA	
D616	DIODE-REC,1R5GU41	893 399030AA	
D617	DIODE-REC,UF5404,DO201AD	893 399044AA	
D618	DIODE-SIG,1N4148,DO-35	893 114148AANM	
D619	DIODE-SIG,1N4148,DO-35	893 114148AANM	
D620	DIODE-REC,1N4002,DO-41	893 314002AANE	
D621	DIODE-REC,UF4004,DO-41	893 394004AA	
D622	DIODE-REC,1R5GU41	93 399030AA	
D623	DIODE-REC,UF5404,DO201AD	893 399044AA	
	ICS		
IC201	IC-MPU,8752,MICROCOMPUTER	877 108752AA	
IC201	CON-IC SOCKET,40P	935 155140DC	
IC202	IC-MEM,EEPROM,93C66,-	883 609366AA	
IC203	IC-LIN,62358,D/A CONVERT	881 462358AA	
IC204	IC-LIN,8138A,REGULATOR	881 308138SA	
IC206	IC-LIN,7045,REGULATOR	881 307045TA	
IC401	IC-LIN,358,OP AMP	881 100358AANA	
IC402	IC-MOS,74HC221,MULTIVIBR	873 760221AANB	
IC403	IC-MOS,14046,PLL	873 404046AANB	
IC404	IC-MOS,14066,SWITCH	873 404066AANG	
IC405	IC-LIN,3842,PWM CONTROL	881 903842AB	
IC406	IC-LIN,431,REGULATOR	881 300431TANB	
IC407	IC-LIN,358,OP AMP	881 100358AANA	
IC501	IC-LIN,DL494,PWM	881 600494AA	
IC502	IC-LIN,431,REGULATOR	881 300431TANB	
IC601	IC-HYB,STR81145A(LF501)	887 490018AA	
⚠ IC602	IC-LIN,3842,PWM CONTROL	881 903842AB	

LOC. NO	DESCRIPTION	CODE NO	REMARK
IC603	OPT-COUPL,TR,CQY80NG	895 520080AA	
IC604	IC-LIN,431,REGULATOR	881 300431TANB	
IC605	IC-HYB,VOLTAGE REGULATION	887 490042AA	
IC606	OPT-COUPL,TR,CQY80NG	895 520080AA	
IC701	IC-LIN,324,OP AMP	881 100324AANB	
IC702	IC-MOS,14066,SWITCH	873 404066AANG	
	COILS		
L401	COIL-CHOKE,7.5mH	925 460186CA	
L402	COIL-CHOKE,20uH	925 460190CA	
L403	COIL-LINEARITY,4.0uH	925 460190EA	
L404	COIL-CHOKE,3.8uH	925 460190BA	
⚠ L607	COIL-LINE FILTER 150MH	925 460127PA	
	TRANSISTORS		
Q202	TR-NPN,KSC945,TO-92	891 390006XB	
Q203	TR-NPN,MPS2369,TO-92	891 392369AB	
Q204	TR-NPN,MPS2369,TO-92	891 392369AB	
Q401	TR-PNP,MPS2907A,TO-92	891 192907XANA	
Q403	TR-NPN,KSP2222A,TO-92	891 392222XA	
Q404	FET-N,VN2222LL,TO-226AA	891 892222AA	
Q405	FET-N,VN2222LL,TO-226AA	891 892222AA	
Q406	TR-NPN,KSC945,TO-92	891 390006XB	
Q407	TR-NPN,KSP2222A,TO-92	891 392222XA	
Q408	TR-NPN,2N3904,TO-92	891 323904XANC	
Q409	TR-PNP,KSA733,TO-92	91 190733XC	
Q410	FET-N,VN0606M,TO-237	891 890606AA	
Q411	FET-N,IRF740,TO-220	891 890740AA	
Q412	FET-N,IRF610,TO-220AB	891 890610AA	
Q413	TR-NPN,MJW16212,340B-03	891 499010AA	
Q414	TR-NPN,KSC1008,TO-92	891 391008XA	
Q415	FET-N,IRF640,TO-220AB	891 890021AB	
Q416	FET-N,IRF640,TO-220AB	891 890021AB	
Q417	FET-N,IRF640,TO-220AB	891 890021AB	
Q418	FET-N,IRF640,TO-220AB	891 890021AB	
Q419	FET-N,IRF640,TO-220AB	891 890021AB	
Q420	TR-NPN,KSC1008,TO-92	891 391008XA	
Q421	TR-NPN,2SC3675,TO-220	891 463675AA	
Q422	TR-NPN,MPS3646,TO-92	891 393646AA	
Q423	TR-NPN,KSC945,TO-92	891 390006XB	
Q424	TR-NPN,KSC945,TO-92	891 390006XB	
Q425	TR-NPN,KSC945,TO-92	891 390006XB	

LOC. NO	DESCRIPTION	CODE NO	REMARK
Q501	TR-PNP,KSA733,TO-92	891 190733XC	
Q502	TR-NPN,KSP2222A,TO-92	891 392222XA	
Q503	FET-N,IRF610,TO-220AB	891 890610AA	
Q504	TR-NPN,MJW16212,340B-03	891 499010AA	
Q505	FET-N,IRF740,TO-220	891 890740AA	
Q507	TR-NPN,KSC945,TO-92	891 390006XB	
Q508	TR-NPN,KSC945,TO-92	891 390006XB	
Q509	TR-NPN,KSC945,TO-92	891 390006XB	
Q510	TR-NPN,KSC945,TO-92	891 390006XB	
Q511	TR-PNP,KSA733,TO-92	891 190733XC	
Q512	TR-PNP,KSA733,TO-92	891 190733XC	
Q514	TR-PNP,MPS2907A,TO-92	891 192907XANA	
⚠ Q604	FET-N,2SK1358,TO-3P	891 881358AA	
Q605	TR-NPN,KSC1008,TO-92	891 391008XA	
Q607	TR-NPN,KSC945,TO-92	891 390006XB	
Q608	TR-NPN,KSC945,TO-92	891 390006XB	
Q609	TR-PNP,KSA733,TO-92	891 190733XC	
Q702	TR-NPN,KSC945,TO-92	891 390006XB	
	RESISTORS		
R-NET1	IC-HYB,R-NETWORK,7P	887 135103SE	
R-NET2	IC-HYB,R-NETWORK,7P	887 135472SE	
R200	REF-CF,100,5%,1/4W	911 131007DA	
R201	REF-CF,1M,5%,1/6W	911 171007YA	
R202	REF-CF,1K,5%,1/6W	911 141007YA	
R203	REF-CF,1K,5%,1/6W	911 141007YA	
R204	REF-CF,1K,5%,1/6W	911 141007YA	
R205	REF-CF,1K,5%,1/6W	911 141007YA	
R206	REF-CF,1K,5%,1/6W	911 141007YA	
R207	REF-CF,10K,5%,1/6W	911 151007YA	
R208	REF-CF,100,5%,1/6W	911 131007YA	
R209	REF-CF,100,5%,1/6W	911 131007YA	
R210	REF-CF,100,5%,1/6W	911 131007YA	
R212	REF-CF,4.7K,5%,1/6W	911 144707YA	
R214	REF-CF,100,5%,1/6W	911 131007YA	
R217	REF-CF,330,5%,1/4W	911 133307DA	
R218	REF-CF,4.7K,5%,1/6W	911 144707YA	
R219	REF-MO,300,5%,1W	911 333007GA	
R220	REF-CF,10K,5%,1/6W	911 151007YA	
R221	REF-CF,10K,5%,1/6W	911 151007YA	
R222	REF-CF,10K,5%,1/6W	911 151007YA	
R223	REF-CF,1.2K,5%,1/6W	911 141207YA	
R224	REF-CF,1K,5%,1/6W	911 141007YA	

LOC. NO	DESCRIPTION	CODE NO.	REMARK
R225	REF-CF,680,5%,1/6W	911 136807YA	
R226	REF-CF,680,5%,1/6W	911 136807YA	
R227	REF-CF,10K,5%,1/6W	911 151007YA	
R228	REF-CF,10K,5%,1/6W	911 151007YA	
R229	REF-CF,10K,5%,1/6W	911 151007YA	
R230	REF-CF,100,5%,1/6W	911 131007YA	
R231	REF-CF,270,5%,1/2W(S)	911 132707FF	
R232	REF-CF,1,5%,1/4W	911 111007DA	
R233	REF-CF,100,5%,1/6W	911 131007YA	
R400	REF-CF,910,5%,1/4W	911 139107DA	
R401	REF-CF,10K,5%,1/6W	911 151007YA	
R402	REF-CF,1.5K,5%,1/6W	911 141507YA	
R403	REF-CF,1K,5%,1/6W	911 141007YA	
R404	REF-CF,22K,5%,1/6W	911 152207YA	
R406	REF-CF,390K,5%,1/6W	911 163907YA	
R407	REF-CF,100K,5%,1/6W	911 161007YA	
R408	REF-CF,39K,5%,1/6W	911 153907YA	
R409	REF-CF,430K,5%,1/6W	911 164307YA	
R410	REF-CF,100K,5%,1/6W	911 161007YA	
R411	REF-CF,12K,5%,1/6W	911 151207YA	
R412	REF-CF,4.7K,5%,1/6W	911 144707YA	
R413	REF-CF,1K,5%,1/6W	911 141007YA	
R414	REF-CF,10K,5%,1/6W	911 151007YA	
R415	REF-CF,1K,5%,1/2W(S)	911 141007FF	
R416	REF-CF,100,5%,1/6W	911 131007YA	
R417	REF-CF,150K,5%,1/6W	911 161507YA	
R418	REF-CF,2.2K,5%,1/6W	911 142207YA	
R419	REF-CF,2.2K,5%,1/6W	911 142207YA	
R420	REF-CF,1K,5%,1/6W	911 141007YA	
R421	REF-CF,1K,5%,1/6W	911 141007YA	
R422	REF-CF,8.2K,5%,1/6W	911 148207YA	
R423	REF-CF,560,5%,1/6W	911 135607YA	
R424	REF-MF,6.8K,1%,1/8W	911 446805CA	
R425	REF-MF,22K,1%,1/8W	911 452205CA	
R426	REF-CF,220K,5%,1/6W	911 162207YA	
R427	REF-CF,100K,5%,1/6W	911 161007YA	
R428	REF-CF,4.7K,5%,1/6W	911 144707YA	
R429	REF-CF,220K,5%,1/6W	911 162207YA	
R430	REF-CF,3K,5%,1/6W	911 143007YA	
R431	REF-CF,22K,5%,1/6W	911 152207YA	
R432	REF-CF,2.2K,5%,1/6W	911 142207YA	
R433	REF-CF,10K,5%,1/6W	911 151007YA	

LOC. NO	DESCRIPTION	CODE NO	REMARK
R434	REF-MF,3.3K,1%,1/8W	911 443305CA	
R435	REF-MF,2K,1%,1/4W	911 442005DA	
R436	REF-MF,1.5K,1%,1/8W	911 441505CA	
R437	REF-CF,2.7K,5%,1/6W	911 142707YA	
R438	REF-CF,5.1K,5%,1/6W	911 145107YA	
R439	REF-CF,47K,5%,1/6W	911 154707YA	
R440	REF-CF,10K,5%,1/6W	911 151007YA	
R441	REF-CF,820,5%,1/6W	911 138207YA	
R442	REF-CF,1K,5%,1/6W	911 141007YA	
R443	REF-MF,1.2K,1%,1/4W	911 441205DA	
R444	REF-CF,1K,5%,1/6W	911 141007YA	
R445	REF-CF,47K,5%,1/6W	911 154707YA	
R446	REF-CF,2.2K,5%,1/6W	911 142207YA	
R447	REF-CF,680,5%,1/2W(S)	911 136807FF	
R448	REF-CF,33K,5%,1/6W	911 153307YA	
R449	REF-CF,27K,5%,1/6W	911 152707YA	
R450	REF-CF,330K,5%,1/6W	911 163307YA	
R451	REF-CF,10K,5%,1/6W	911 151007YA	
R452	REF-CF,2.2K,5%,1/6W	911 142207YA	
R453	REF-CF,10K,5%,1/6W	911 151007YA	
R454	REF-CF,82,5%,1/4W	911 128207DA	
R455	REF-CF,120,5%,1/4W	911 131207DA	
R456	REF-CF,110,5%,1/4W	911 131107DA	
R457	REF-CF,100K,5%,1/6W	911 161007YA	
R458	REF-CF,2.2,5%,1/2W	911 112207FA	
R459	REF-CF,2.4K,5%,1/6W	911 142407YA	
R460	REF-WW,120,5%,5W	911 631207PW	
R461	REF-WW,120,5%,5W	911 631207PW	
R462	REF-CF,220,5%,1/4W	911 132207DA	
R463	REF-MO,2.2,5%,3W(S)	911 312207LF	
R464	REF-CF,3.9,5%,1/2W	911 113907FA	
R465	REF-CF,3.9,5%,1/2W	911 113907FA	
R466	REF-CF,3.9,5%,1/2W	911 113907FA	
R467	REF-MO,270,5%,2W(S)	911 332707JF	
R468	REF-MO,6.8,5%,3W(S)	911 316809LF	
R469	REF-CF,100,5%,1/2W	911 131007FA	
R470	REF-CF,1M,5%,1/6W	911 171007YA	
R471	REF-CF,1M,5%,1/6W	911 171007YA	
R472	REF-CF,1M,5%,1/6W	911 171007YA	
R473	REF-CF,1M,5%,1/6W	911 171007YA	
R474	REF-CF,1M,5%,1/6W	911 171007YA	
R475	REF-CF,22K,5%,1/6W	911 152207YA	
R476	REF-CF,2.7K,5%,1/6W	911 152207YA	

LOC. NO	DESCRIPTION	CODE NO	REMARK
R477	REF-CF,22K,5%,1/6W	911 152207YA	
R478	REF-CF,1.2K,5%,1/6W	911 141207YA	
R479	REF-CF,22K,5%,1/6W	911 152207YA	
R480	REF-CF,1.2K,5%,1/6W	911 141207YA	
R481	REF-CF,1.2K,5%,1/6W	911 141207YA	
R482	REF-CF,22K,5%,1/6W	911 152207YA	
R483	REF-CF,22K,5%,1/6W	911 152207YA	
R484	REF-CF,1.2K,5%,1/6W	911 141207YA	
R485	REF-CF,22K,5%,1/6W	911 152207YA	
R486	REF-MO,33,5%,1W	911 323307GA	
R487	REF-CF,390K,5%,1/2W	911 163907FA	
R488	REF-CF,330K,5%,1/2W	911 163307FA	
R489	REF-CF,1.2K,5%,1/6W	911 141207YA	
R490	REF-CF,1K,5%,1/6W	911 141007YA	
R491	REF-CF,10K,5%,1/6W	911 151007YA	
R492	REF-CF,2.7K,5%,1/6W	911 142707YA	
R493	REF-CF,1K,5%,1/6W	911 141007YA	
R494	REF-CF,220K,5%,1/6W	911 162207YA	
R495	REF-CF,200K,5%,1/6W	911 162007YA	
R496	REF-CF,1.2K,5%,1/6W	911 141207YA	
R497	REF-CF,100,5%,1/6W	911 131007YA	
R500	REF-CF,10K,5%,1/6W	911 151007YA	
R501	REF-CF,1K,5%,1/6W	911 141007YA	
R502	REF-CF,1K,5%,1/6W	911 141007YA	
R503	REF-CF,3.3K,5%,1/6W	911 143307YA	
R504	REF-CF,120,5%,1/6W	911 131207YA	
R505	REF-WW,390,5%,5W	911 633907PW	
R506	REF-MO,220,5%,1W(S)	911 332207GF	
R507	REF-WW,390,5%,5W	911 633907PW	
R508	REF-FUSIBLE,3.3,5%,1/2W	911 813307FA	
R509	REF-CF,2.2,5%,1/4W	911 112207DA	
R510	REF-CF,18K,5%,1/6W	911 151807YA	
R511	REF-CF,10K,5%,1/6W	911 151007YA	
R512	REF-CF,5.1K,5%,1/6W	911 145107YA	
R513	REF-CF,2.2,5%,1/2W(S)	911 112207FF	
R514	REF-CF,390,5%,1/6W	911 133907YA	
R517	REF-MF,680,3%,1/4W	911 436807CA	
R518	REF-MF,6.8K,3%,1/4W	911 446807CA	
R519	REF-CF,5.1K,5%,1/6W	911 145107YA	
R520	REF-CF,100K,5%,1/6W	911 161007YA	
R521	REF-CF,12K,5%,1/6W	911 151207YA	
R522	REF-CF,1M,5%,1/6W	911 171007YA	
R524	REF-CF,68K,5%,1/6W	911 156807YA	
R525	REF-CF,3.3K,5%,1/6W	911 143307YA	

LOC. NO	DESCRIPTION	CODE NO.	REMARK
R526	REF-CF,5.6K,5%,1/6W	911 145607YA	
R527	REF-CF,33K,5%,1/6W	911 153307YA	
R528	REF-CF,12K,5%,1/6W	911 151207YA	
R529	REF-CF,12K,5%,1/6W	911 151207YA	
R530	REF-CF,390,5%,1/6W	911 133907YA	
R531	REF-CF,1.5K,5%,1/6W	911 141507YA	
R532	REF-MO,2.2,5%,3W(S)	911 312207LF	
R533	REF-CF,470,5%,1/6W	911 134707YA	
R534	REF-CF,1K,5%,1/4W	911 141007DA	
R535	REF-CF,2.2K,5%,1/6W	911 142207YA	
R536	REF-CF,20K,5%,1/6W	911 152007YA	
R537	REF-CF,390K,5%,1/6W	911 163907YA	
R540	REF-CF,10K,5%,1/6W	911 151007YA	
R541	REF-CF,2.2K,5%,1/6W	911 142207YA	
R542	REF-CF,1K,5%,1/6W	911 141007YA	
R543	REF-CF,10K,5%,1/6W	911 151007YA	
R544	REF-MF,2K,3%,1/4W	911 442005DA	
⚠ R601	REF-CF,390K,5%,1/2W	911 163907FA	
R602	REF-WW,5,5%,7W	911 615007QW	
R603	REF-WW,5,5%,7W	911 615007QW	
R604	REF-MO,100K,5%,2W(S)	911 361007JF	
R605	REF-MO,100K,5%,2W(S)	911 361007JF	
R606	REF-CC,100,10%,1/2W	911 231008FA	
R607	REF-CF,4.7,5%,1/4W	911 114707DA	
R616	REF-CF,1M,5%,1/6W	911 171007YA	
R617	REF-CF,51K,5%,1/6W	911 155107YA	
R618	REF-CF,27K,5%,1/6W	911 152707YA	
R619	REF-CF,2.7K,5%,1/6W	911 142707YA	
R620	REF-CF,2.7K,5%,1/6W	911 142707YA	
R623	REF-CF,4.7,5%,1/2W	911 114707FA	
R624	REF-MO,100K,5%,3W(S)	911 361007LF	
R625	REF-MO,100K,5%,3W(S)	911 361007LF	
R626	REF-CF,100K,5%,1/6W	911 161007YA	
R627	REF-WW,0.22,5%,2W	911 602207JU	
R628	REF-CF,1K,5%,1/6W	911 141007YA	
R629	REF-CF,47K,5%,1/6W	911 154707YA	
R630	REF-CF,2.2K,5%,1/6W	911 142207YA	
R631	REF-CF,2.2K,5%,1/6W	911 142207YA	
R632	REF-CF,180K,5%,1/2W(S)	911 161807FF	
R633	REF-CF,6.8K,5%,1/6W	911 146807YA	
R634	REF-MF,2.2K,1%,1/4W	911 442205DA	
R635	REF-MO,100K,5%,3W(S)	911 361007LF	
R636	REF-CF,22K,5%,1/6W	911 152207YA	

LOC. NO	DESCRIPTION	CODE NO.	REMARK
R637	REF-MO,100K,5%,3W(S)	911 361007LF	
R638	REF-MF,22,1%,1/4W	911 422205DA	
R639	REF-CF,100,5%,1/2W	911 131007FA	
R641	REF-CF,270K,5%,1/2W(S)	911 162707FF	
R642	REF-CF,150,5%,1/6W	911 131507YA	
R643	REF-CF,4.7,5%,1/2W	911 114707FA	
R644	REF-CF,22,5%,1/4W	911 122207DA	
R645	REF-CF,22K,5%,1/6W	911 152207YA	
R646	REF-CF,1K,5%,1/6W	911 141007YA	
R647	REF-CF,330,5%,1/6W	911 133307YA	
R648	REF-CF,10K,5%,1/6W	911 151007YA	
R649	REF-CF,1K,5%,1/6W	911 141007YA	
R650	REF-CF,270K,5%,1/2W(S)	911 162707FF	
R700	REF-MO,27,5%,2W	911 322707JA	
R701	REF-CF,12K,5%,1/6W	911 151120YA	
R702	REF-CF,100K,5%,1/6W	911 161007YA	
R703	REF-CF,6.8K,5%,1/6W	911 146807YA	
R704	REF-CF,10K,5%,1/6W	911 151007YA	
R705	REF-CF,33K,5%,1/6W	911 153307YA	
R706	REF-CF,33K,5%,1/6W	911 153307YA	
R707	REF-CF,120K,5%,1/6W	911 161207YA	
R708	REF-CF,1M,5%,1/4W	911 171007DA	
R709	REF-CF,27K,5%,1/6W	911 152707YA	
R710	REF-CF,47K,5%,1/6W	911 154707YA	
R711	REF-CF,12K,5%,1/6W	911 151207YA	
R712	REF-CF,12K,5%,1/6W	911 151207YA	
R713	REF-CF,15K,5%,1/6W	911 151507YA	
R714	REF-CF,43K,5%,1/6W	911 154307YA	
R715	REF-CF,2.4K,5%,1/6W	911 142407YA	
R716	REF-CF,3.3K,5%,1/6W	911 143307YA	
R718	REF-CF,1K,5%,1/4W	911 141007DA	
R719	REF-CF,4.7K,5%,1/6W	911 144707YA	
R720	REF-CF,10K,5%,1/6W	911 151007YA	
R721	REF-CF,10K,5%,1/6W	911 151007YA	
RL401	RELAY,MINIATURE,12VDC	927 300052BB	
RL402	RELAY,MINIATURE,12VDC	927 300052BB	
RL601	RELAY,MINIATURE,12VDC	927 300052BB	
R717	REF-CF,15K,5%,1/6W	911 151507YA	
	SWITCHS		
SW201	SWITCH-TACT,6.2X6.2X4MM	933 210043AE	
SW202	SWITCH-TACT,6.2X6.2X4MM	933 210043AE	
SW203	SWITCH-TACT,6.2X6.2X4MM	933 210043AE	

LOC. NO	DESCRIPTION	CODE NO.	REMARK
SW204	SWITCH-TACT,6.2X6.2X4MM	933 210043AE	
SW205	SWITCH-TACT,6.2X6.2X4MM	933 210043AE	
SW206	SWITCH-TACT,6.2X6.2X4MM	933 210043AE	
SW207	SWITCH-TACT,6.2X6.2X4MM	933 210043AE	
SW208	SWITCH-TACT,6.2X6.2X4MM	933 210043AE	
SW401	SWITCH-TOGGLE,SP3T	933 110034TC	
	TRANS		
T401	TRANS-HDT,CSG9511	923 460149EA	
T402	TRANS-HOR.PULSE	923 460157EA	
T403	TRANS-HOR.SENSE	923 460133CA	
T404	TRANS-H-SIZE DRIVE	923 460149HA	
T405	TRANS-FOCUS	923 460160EA	
T501	TRANS-H/V.BASE DRIVE	923 460149DA	
T502	TRANS-FLYBACK,0.70mH	923 460160BA	
T503	TRANS-H/V REG.CFA7679	923 460157FA	
⚠ T601	TRANS-POWER S/W	923 460160DA	
⚠ T602	TRANS-SYNC	923 460065AA	
⚠ T603	TRANS-POWER(DPMS)	923 460156AA	
	VRS		
VR201	SWITCH-ROTARY,390S	933 230035AA	
VR501	RES-VAR,SF-ROUND,20KOHM	913 452008BF	
VR502	RES-VAR,SF-ROUND,10KOHM	913 451008BF	
VR503	RES-VAR,ROTARY,10K(CT)	913 151007YA	
VR504	RES-VAR,ROTARY,5K	913 145007YA	
VR601	RES-VAR,SF-ROUND,200OHM	913 432008BF	
	ZENER DIODES		
ZD201	DIODE-ZEN,UZ-5.1B,DO-35	893 290031FB	
ZD202	DIODE-ZEN,UZ-5.1B,DO-35	893 290031FB	
ZD203	DIODE-ZEN,UZ-5.1B,DO-35	893 290031FB	
ZD206	DIODE-ZEN,UZ-5.1,DO-35	893 290031FB	
ZD401	DIODE-ZEN,UZ-5.1B,DO-35	893 290031FB	
ZD501	DIODE-ZEN,ZPD18,DO-35	893 290002BS	
ZD502	DIODE-ZEN,ZPD2.7,DO-35	893 290002AC	
ZD503	DIODE-ZEN,UZ-15BM DO-35	893 290031TB	
	OTHERS		
⚠ F601	FUSE-CERA TUB,3.15A,250V	949 115105THNA	
FUSE CLIP	FUSE-CLIP,5.2X20,30MOHM	953 260023BC	

LOC. NO	DESCRIPTION	CODE NO.	REMARK
LD201	LED,G/Y,ROUND,4.8MM	895 110048DA	
LD202	LED,D,ROUND,5MM	895 110054DB	
PCB	PCB-MAIN,CFG963*,2LAYER	947 460041AA	
⚠ PTH601	POSISTOR,14,SQUARE,13.5X1	897 110535AA	
XTAL201	CRYSTAL,12M,50	941 110067UBNA	
CRT	CRT,COLOR,19", 0.28MM	897 250169AA	
CRT GND	CBF-GROUND CRT,ASSY	955 460056AAAA	
D-COIL	COIL-DEGAUSSING,17.6mH	925 460190AA	
⚠ S/W	SWITCH-PUSH BUTTON,SPST	03529-705-010	
P-S/W	CBF-CONN ASSY, 450MM,2P	955 460540ABAA	
P/CORD	CBF-POWER CORD,1850MM,UC	955 001434AAAA	
S/CABLE	CBF-SIGNAL CABLE,1830MM	955 460511AAAA	
VIDEO PCB			
	FERRITE BEADS		
BD1	MAG-CORE,FERRITE,BEAD	937 120211AA	
BD2	MAG-CORE,FERRITE,BEAD	937 120211AA	
BD3	MAG-CORE,FERRITE,BEAD	937 120211AA	
	CAPACITORS		
C101	CAP-AL.ELEC,106M,2E,105C,	917 872100QM	
C102	CAP-CERAMIC,103J,2A,MONO	915 265100LJXH	
C103	CAP-CERAMIC,333K,2A,X7R	915 265330LKXXNA	
C104	CAP-CERAMIC,104J,1H,MONO	915 266100HJXH	
C105	CAP-AL,ELEC,106M,1E,5X5	917 822100EM	
C106	CAP-CERAMIC,104J,1H,MONO	915 266100HJXH	
C107	CAP-CERAMIC,331J,2A,MONO	915 163330LJXH	
C109	CAP-CERAMIC,104Z,1H,Y5V	915 336100HZVH	
C110	CAP-AL.ELEC,227M,1E	917 123220EM	
C111	CAP-CERAMIC,103J,2A,MONO	915 265100LJXH	
C112	CAP-AL.ELEC,687M,1E	917 123680EM	
C113	CAP-AL.ELEC,107M,1E	917 123100EM	
C114	CAP-CERAMIC,103J,2A,MONO	915 265100LJXH	
C115	CAP-AL.ELEC,107M,1C	917 723100CM	
C116	CAP-CERAMIC,333K,2A,X7R	915 265330LKXXNA	
C118	CAP-AL,ELEC,106M,1E,5X5	917 822100EM	
C119	CAP-CERAMIC,104J,1H,MONO	915 266100HJXH	
C120	CAP-CERAMIC,104J,1H,MONO	915 266100HJXH	

LOC. NO	DESCRIPTION	CODE NO.	REMARK
C127	CAP-AL.ELEC,105M,1H,4X5	917 821100HM	
C129	CAP-MPETP,104J,2E,7.5P	916 556100QJAL	
C130	CAP-CERAMIC,104J,1H,MONO	915 266100HJXH	
C131	CAP-CERAMIC,103J,2A,MONO	915 265100LJXH	
C134	CAP-CERAMIC,104J,1H,MONO	915 266100HJXH	
C135	CAP-CERAMIC,104J,1H,MONO	915 266100HJXH	
C136	CAP-CERAMIC,104J,1H,MONO	915 266100HJXH	
C137	CAP-AL.ELEC,107M,1E	917 123100EM	
C138	CAP-CERAMIC,330J,1H,NPO	915 312330HJXH	
C139	CAP-CERAMIC,331J,2A,MONO	915 163330LJXH	
C140	CAP-AL.ELEC,107M,1C	917 723100CM	
C141	CAP-AL.ELEC,107M,1C	917 723100CM	
C142	CAP-CERAMIC,103J,2A,MONO	915 265100LJXH	
C143	CAP-CERAMIC,390J,1H,NPO	915 312390HJXH	
C144	CAP-CERAMIC,390J,1H,NPO	915 312390HJXH	
C145	CAP-CERAMIC,104J,1H,MONO	915 266100HJXH	
C146	CAP-CERAMIC,220J,1H,NPO	915 312220HJXH	
C148	CAP-CERAMIC,104J,1H,MONO	915 266100HJXH	
C149	CAP-CERAMIC,220J,1H,NPO	915 312220HJXH	
C150	CAP-CERAMIC,222K,1H,Y5P	915 324220HKPH	
C151	CAP-CERAMIC,103J,2A,MONO	915 265100LJXH	
C153	CAP-CERAMIC,104J,1H,MONO	915 266100HJXH	
C154	CAP-CERAMIC,104J,1H,MONO	915 266100HJXH	
C156	CAP-AL.ELEC,476M,1C,6.3X7	917 722470CM	
C157	CAP-CERAMIC,101J,1H,NPO	915 313100HJXH	
C164	CAP-MYLAR,682J,2A,5P	916 164680LJAH	
C168	CAP-AL,ELEC,106M,1E,5X5	917 822100EM	
C169	CAP-AL,ELEC,106M,1E,5X5	917 822100EM	
C170	CAP-AL.ELEC,476M,1C,6.3X7	917 722470CM	
C30	CAP-AL.ELEC,226M,1E	917 122220EM	
C301	CAP-AL.ELEC,107M,1C	917 723100CM	
C302	CAP-CERAMIC,103Z,1H,Y5V	915 325100HZVH	
C303	CAP-MPETP,104J,1J,5P	916 566100JJAH	
C304	CAP-AL.ELEC,475M,1H,105C	917 741470HM	
C306	CAP-MPETP,105K,1J,5P	916 567100JKAH	
C307	CAP-MPETP,224K,1J,5P	916 566220JKAH	
C308	CAP-AL.ELEC,475M,1H	917 121470HM	
C309	CAP-MYLAR,153J,2A,5P	916 165150LJAH	
C31	CAP-AL.ELEC,226M,1E	917 122220EM	
C310	CAP-AL.ELEC,227M,1E,105C	917 743220EM	
C311	CAP-MPETP,104J,1J,5P	916 566100JJAH	
C312	CAP-AL.ELEC,227M,1V,105C	917 743220FM	
C313	CAP-AL.ELEC,477M,1V,105C	917 743470FM	

LOC. NO	DESCRIPTION	CODE NO.	REMARK
C314	CAP-MPETP,104J,1J,5P	916 566100JJAH	
C315	CAP-AL.ELEC,228M.1V,105C	917 874220FMAH	
C317	CAP-AL.ELEC,476M,1H,105C	917 742470HM	
C319	CAP-MPETP,224K,1J,5P	916 566220JKAH	
C32	CAP-AL.ELEC,226M,1E	917 122220EM	
C321	CAP-AL.ELEC,107M,1V,105C	917 743100FM	
C322	CAP-AL.ELEC,475M,1H	917 121470HM	
C330	CAP-AL.ELEC,227M,1V	917 123220FM	
CB1	CAP-AL,ELEC,106M,1E,5X5	917 822100EM	
CB11	CAP-MPETP,104J,2E,7.5P	916 556100QJAL	
CB12	CAP-CERAMIC,104J,1H,MONO	915 266100HJXH	
CB128	CAP-AL.ELEC,225M,2C	917 121220NM	
CB13	CAP-MPETP,104J,2E,7.5P	916 556100QJAL	
CB14	CAP-CERAMIC,102J,2A,MONO	915 164100LJXH	
CB15	CAP-AL.ELEC,106M,2E,105C	917 872100QM	
CB2	CAP-CERAMIC,104J,1H,MONO	915 266100HJXH	
CB20	CAP-CERAMIC,103J,2A,MONO	915 265100LJXH	
CB4	CAP-CERAMIC,104J,1H,MONO	915 266100HJXH	
CB6	CAP-CERAMIC,104J,1H,MONO	915 266100HJXH	
CB8	CAP-CERAMIC,120J,1H,NPO	915 312120HJXH	
CB9	CAP-CERAMIC,270J,1H,NPO	915 312270HJXH	
CG1	CAP-AL,ELEC,106M,1E,5X5	917 822100EM	
CG11	CAP-MPETP,104J,2E,7.5P	916 556100QJAL	
CG12	CAP-CERAMIC,104J,1H,MONO	915 266100HJXH	
CG128	CAP-AL.ELEC,225M,2C	917 121220NM	
CG13	CAP-MPETP,104J,2E,7.5P	916 556100QJAL	
CG14	CAP-CERAMIC,102J,2A,MONO	915 164100LJXH	
CG15	CAP-AL.ELEC,106M,2E,105C	917 872100QM	
CG2	CAP-CERAMIC,104J,1H,MONO	915 266100HJXH	
CG20	CAP-CERAMIC,103J,2A,MONO	915 265100LJXH	
CG4	CAP-CERAMIC,104J,1H,MONO	915 266100HJXH	
CG6	CAP-CERAMIC,104J,1H,MONO	915 266100HJXH	
CG8	CAP-CERAMIC,120J,1H,NPO	915 312120HJXH	
CG9	CAP-CERAMIC,270J,1H,NPO	915 312270HJXH	
CR1	CAP-AL,ELEC,106M,1E,5X5	917 822100EM	
CR11	CAP-MPETP,104J,2E,7.5P	916 556100QJAL	
CR12	CAP-CERAMIC,104J,1H,MONO	915 266100HJXH	
CR128	CAP-AL.ELEC,225M,2C	917 121220NM	
CR13	CAP-MPETP,104J,2E,7.5P	916 556100QJAL	
CR14	CAP-CERAMIC,102J,2A,MONO	915 164100LJXH	
CR15	CAP-AL.ELEC,106M,2E,105C	917 872100QM	

LOC. NO	DESCRIPTION	CODE NO.	REMARK
CR2	CAP-CERAMIC,104J,1H,MONO	915 266100HJXH	
CR20	CAP-CERAMIC,103J,2A,MONO	915 265100LJXH	
CR4	CAP-CERAMIC,104J,1H,MONO	915 266100HJXH	
CR6	CAP-CERAMIC,104J,1H,MONO	915 266100HJXH	
CR8	CAP-CERAMIC,120J,1H,NPO	915 312120HJXH	
CR9	CAP-CERAMIC,270J,1H,NPO	915 312270HJXH	
	CONNECTORS		
CN1	CON-MINIATURE JACK	935 720084AA	
CN10,CN11	CBF-CONN ASSY, 200MM,4P R	955 460541ABAB	
CN101	CBF-CONN ASSY, 150MM,7P	955 460530AAAA	
CN102	CBF-CONN ASSY, 150MM,8P	955 460528AAAA	
CN103	CBF-CONN ASSY, 100MM,11P	955 460535AAAA	
CN12,CN13	CBF-CONN ASSY, 200MM,4P B	955 460541ABAA	
CN301	CBF-CONN ASSY, 100MM,10P	955 460537AAAA	
CN302	CON-WALL HEADER,3P,3.96	935 241303EDNA	
	DIODES		
D101	DIODE-REC,1N4007GP,DO-41	893 314007BA	
D102	DIODE-REC,1N4007GP,DO-41	893 314007BA	
D103	DIODE-SIG,1N4148,DO-35	893 114148AANM	
D106	DIODE-ZEN,UZ-5.1B,DO-35	893 290031FB	
D108	DIODE-ZEN,UZ-5.1B,DO-35	893 290031FB	
D110	DIODE-ZEN,UZ-5.1B,DO-35	893 290031FB	
D112	DIODE-SIG,1N4148,DO-35	893 114148AANM	
D116	DIODE-ZEN,UZ-5.1B,DO-35	893 290031FB	
D117	DIODE-SIG,1N4148,DO-35	893 114148AANM	
D160	DIODE-ZEN,ZPD2.7,DO-35	893 290002AC	
D301	DIODE-REC,1N4001,DO-41	893 314001AANH	
D302	DIODE-SIG,1N4148,DO-35	893 114148AANM	
D303	DIODE-SIG,1N4148,DO-35	893 114148AANM	
D304	DIODE-SIG,1N4148,DO-35	893 114148AANM	
D305	DIODE-SIG,1N4148,DO-35	893 114148AANM	
DB6	DIODE-SIG,BAV21,DO-35	893 190021AANA	
DB7	DIODE-SIG,BAV21,DO-35	893 190021AANA	
DB1	DIODE-SIG,1N4148,DO-35	893 114148AANM	
DB2	DIODE-SIG,1N4148,DO-35	893 114148AANM	
DB21	DIODE-SIG,1N4148,DO-35	893 114148AANM	
DB22	DIODE-SIG,1N4148,DO-35	893 114148AANM	
DB23	DIODE-SIG,1N4148,DO-35	893 114148AANM	
DB3	DIODE-SIG,1N4148,DO-35	893 114148AANM	

LOC. NO	DESCRIPTION	CODE NO.	REMARK
DB5	DIODE-SIG,1N4148,DO-35	893 114148AANM	
DG6	DIODE-SIG,BAV21,DO-35	893 190021AANA	
DG7	DIODE-SIG,BAV21,DO-35	893 190021AANA	
DG1	DIODE-SIG,1N4148,DO-35	893 114148AANM	
DG2	DIODE-SIG,1N4148,DO-35	893 114148AANM	
DG21	DIODE-SIG,1N4148,DO-35	893 114148AANM	
DG22	DIODE-SIG,1N4148,DO-35	893 114148AANM	
DG23	DIODE-SIG,1N4148,DO-35	893 114148AANM	
DG3	DIODE-SIG,1N4148,DO-35	893 114148AANM	
DG5	DIODE-SIG,1N4148,DO-35	893 114148AANM	
DR6	DIODE-SIG,BAV21,DO-35	893 190021AANA	
DR7	DIODE-SIG,BAV21,DO-35	893 190021AANA	
DR1	DIODE-SIG,1N4148,DO-35	893 114148AANM	
DR2	DIODE-SIG,1N4148,DO-35	893 114148AANM	
DR21	DIODE-SIG,1N4148,DO-35	893 114148AANM	
DR22	DIODE-SIG,1N4148,DO-35	893 114148AANM	
DR23	DIODE-SIG,1N4148,DO-35	893 114148AANM	
DR3	DIODE-SIG,1N4148,DO-35	893 114148AANM	
DR5	DIODE-SIG,1N4148,DO-35	893 114148AANM	
	ICS		
IC101	IC-LIN,1205,VIDEO AMP	881 101205AA	
IC103	IC-LIN,324,OP AMP	881 100324AANB	
IC105	IC-LIN,141540,OSD	881 699008AA	
IC106	IC-LIN,144110,D/A CONVER	881 499002AA	
IC107	IC-LIN,7812,REGULATOR	881 307812KANB	
IC108	IC-LIN,7805,REGULATOR	881 307805KANE	
IC109	IC-LIN,LM319,COMPARATOR	881 200319AA	
IC110	IC-CUS,SL506A,SYNC PROCES	885 460005AA	
IC111	IC-MOS,74HC125,BUFFER	873 760125AA	
IC115	IC-LIN,431,REGULATOR	881 300431TANB	
IC301	IC-LIN,8172,VERTICAL	881 708172SA	
IC302	IC-LIN,9102,H/V PROCESSO	881 709102AA	
IC303	IC-LIN,7824,REGULATOR	881 307824KA	
ICB01	IC-LIN,VPA12,VIDEO AMP	881 100012SA	
ICG01	IC-LIN,VPA12,VIDEO AMP	881 100012SA	
ICR01	IC-LIN,VPA12,VIDEO AMP	881 100012SA	
	TRANSISTORS		
Q101	TR-PNP,2N3906,TO-92	891 123906XANC	
Q102	TR-NPN,KSC1008,TO-92	891 391008XA	

LOC. NO	DESCRIPTION	CODE NO.	REMARK
Q103	TR-NPN,KSC945,TO-92	891 390006XB	
Q104	TR-NPN,2N3904,TO-92	891 323904XANC	
Q105	TR-NPN,MPS3646,TO-92	891 393646AA	
Q106	TR-NPN,KSC945,TO-92	891 390006XB	
Q107	TR-NPN,KSC945,TO-92	891 390006XB	
Q108	TR-NPN,MPS2369,TO-92	891 392369AB	
Q110	TR-NPN,2N3904,TO-92	891 323904XANC	
Q301	TR-NPN,KSC945,TO-92	891 390006XB	
Q302	TR-NPN,KSC945,TO-92	891 390006XB	
Q303	TR-PNP,KSA733,TO-92	891 190733XC	
Q304	TR-NPN,2N3904,TO-92	891 323904XANC	
QB2	TR-NPN,2N5770,TO-92	891 325770AA	
QB3	TR-NPN,KSP42,TO-92	891 390042XANA	
QG2	TR-NPN,2N5770,TO-92	891 325770AA	
QG3	TR-NPN,KSP42,TO-92	891 390042XANA	
QR2	TR-NPN,2N5770,TO-92	891 325770AA	
QR3	TR-NPN,KSP42,TO-92	891 390042XANA	
	RESISTORS		
R 112	REF-CF,100,5%,1/2W	911 131007FA	
R104	REF-CF,10,5%,1/6W	911 121007YA	
R105	REF-MF,12K,1%,1/8W	911 451205CA	
R106	REF-MF,2.7K,1%,1/4W	911 442705DA	
R107	REF-CF,4.7K,5%,1/6W	911 144707YA	
R108	REF-CF,5.6K,5%,1/6W	911 145607YA	
R109	REF-CF,470K,5%,1/4W	911 164707DA	
R110	REF-CF,2.2K,5%,1/6W	911 142207YA	
R111	REF-CF,2.2K,5%,1/6W	911 142207YA	
R113	REF-CF,820,5%,1/6W	911 138207YA	
R114	REF-CF,47K,5%,1/6W	911 154707YA	
R115	REF-CF,47K,5%,1/6W	911 154707YA	
R116	REF-CF,220,5%,1/4W	911 132207DA	
R117	REF-CF,3.3K,5%,1/6W	911 143307YA	
R118	REF-CF,120,5%,1/6W	911 131207YA	
R119	REF-CF,2.2K,5%,1/6W	911 142207YA	
R120	REF-CF,4.7K,5%,1/6W	911 144707YA	
R123	REF-CF,2.2,5%,1/4W	911 112207DA	
R125	REF-CF,10,5%,1/6W	911 121007YA	
R127	REF-CF,10,5%,1/6W	911 121007YA	
R129	REF-CF,100,5%,1/6W	911 131007YA	
R130	REF-CF,2.2K,5%,1/6W	911 142207YA	
R132	REF-CF,33,5%,1/6W	911 123307YA	
R134	REF-CF,22,5%,1/6W	911 122207YA	

LOC. NO	DESCRIPTION	CODE NO.	REMARK
R135	REF-CF,2.2K,5%,1/6W	911 142207YA	
R137	REF-CF,10K,5%,1/6W	911 151007YA	
R139	REF-CF,100,5%,1/6W	911 131007YA	
R140	REF-CF,2.2K,5%,1/6W	911 142207YA	
R142	REF-CF,100,5%,1/6W	911 131007YA	
R144	REF-CF,1K,5%,1/6W	911 141007YA	
R145	REF-CF,1M,5%,1/6W	911 171007YA	
R147	REF-CF,4.7K,5%,1/6W	911 144707YA	
R148	REF-CF,1K,5%,1/6W	911 141007YA	
R149	REF-CF,750,5%,1/6W	911 137507YA	
R150	REF-CF,1.5K,5%,1/6W	911 141507YA	
R151	REF-CF,10,5%,1/4W	911 121007DA	
R153	REF-CF,10K,5%,1/6W	911 151007YA	
R154	REF-CF,1K,5%,1/6W	911 141007YA	
R155	REF-CF,4.7K,5%,1/6W	911 144707YA	
R160	REF-CF,1K,5%,1/6W	911 141007YA	
R161	REF-CF,1K,5%,1/6W	911 141007YA	
R162	REF-CF,12K,5%,1/6W	911 151207YA	
R163	REF-CF,4.7K,5%,1/6W	911 144707YA	
R164	REF-CF,8.2K,5%,1/6W	911 148207YA	
R165	REF-CF,1K,5%,1/6W	911 141007YA	
R301	REF-CF,10K,5%,1/6W	911 151007YA	
R302	REF-CF,4.7K,5%,1/6W	911 144707YA	
R303	REF-CF,3.3K,5%,1/6W	911 143307YA	
R304	REF-CF,2.2K,5%,1/6W	911 142207YA	
R305	REF-CF,180K,5%,1/6W	911 161807YA	
R306	REF-CF,47K,5%,1/6W	911 154707YA	
R307	REF-CF,120K,5%,1/6W	911 161207YA	
R308	REF-CF,10K,5%,1/6W	911 151007YA	
R309	REF-CF,10K,5%,1/6W	911 151007YA	
R310	REF-CF,200K,5%,1/6W	911 162007YA	
R311	REF-CF,100K,5%,1/4W	911 161007DA	
R312	REF-CF,47K,5%,1/6W	911 154707YA	
R313	REF-CF,18K,5%,1/6W	911 151807YA	
R314	REF-CF,24K,5%,1/6W	911 152407YA	
R315	REF-CF,3.9K,5%,1/6W	911 143907YA	
R316	REF-CF,3.9K,5%,1/6W	911 143907YA	
R317	REF-CF,7.5K,5%,1/6W	911 147507YA	
R318	REF-CF,6.2K,5%,1/6W	911 146207YA	
R319	REF-CF,47K,5%,1/6W	911 154707YA	
R320	REF-FUSIBLE,1.2,5%,1/2W	911 811207FA	
R321	REF-MO,300,5%,1W	911 333007GA	
R322	REF-CF,1.5,5%,1/2W	911 111507FA	
R323	REF-CF,68K,5%,1/6W	911 156807YA	

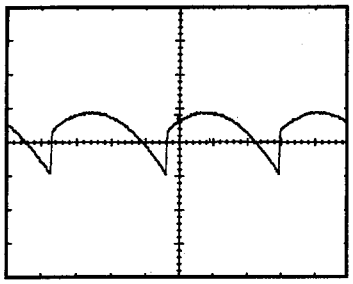
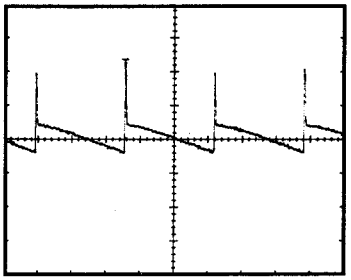
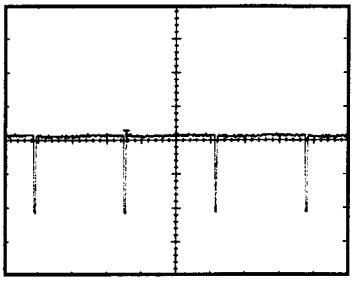
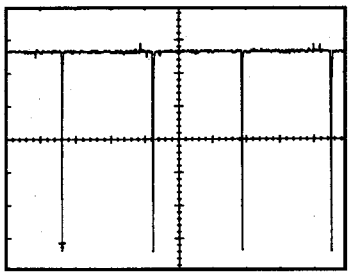
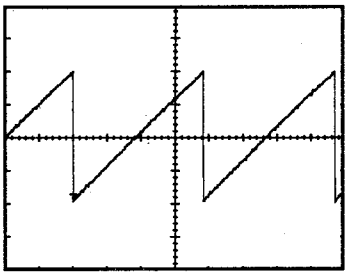
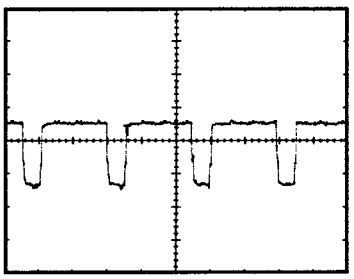
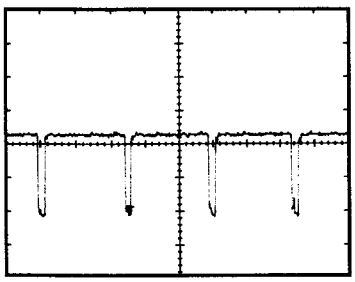
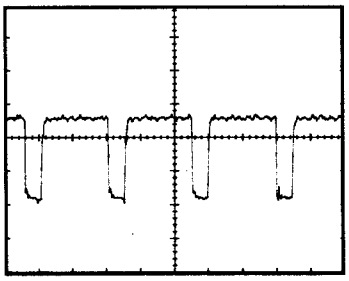
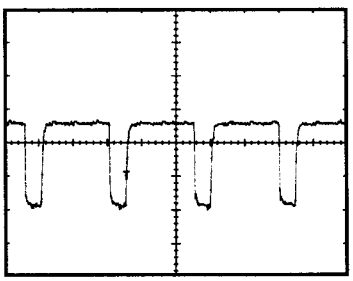
LOC. NO	DESCRIPTION	CODE NO.	REMARK
R324	REF-MO,47,5%,2W(S)	911 324707JF	
R325	REF-CF,62,5%,1/4W	911 126207DA	
R326	REF-CF,6.2K,5%,1/6W	911 146207YA	
R327	REF-CF,22,5%,1/6W	911 122207YA	
R328	REF-CF,750,5%,1/6W	911 137507YA	
R329	REF-MO,1,5%,2W(S)	911 311007JF	
R330	REF-CF,82K,5%,1/6W	911 158207YA	
R332	REF-CF,100K,5%,1/6W	911 161007YA	
RB14	REF-CF,390,5%,1/6W	911 133907YA	
RB28	REF-CF,270K,5%,1/6W	911 162707YA	
RB29	REF-CF,1M,5%,1/6W	911 171007YA	
RB12	REF-CF,2.7K,5%,1/6W	911 142707YA	
RB13	REF-CF,22K,5%,1/6W	911 152207YA	
RB15	REF-CF,33,5%,1/6W	911 123307YA	
RB16	REF-CF,270,5%,1/2W(S)	911 132707FF	
RB17	REF-CF,75,5%,1/6W	911 127507YA	
RB19	REF-CF,15,5%,1/6W	911 121507YA	
RB20	REF-CF,270K,5%,1/6W	911 162707YA	
RB21	REF-CF,270K,5%,1/4W	911 162707DA	
RB22	REF-CF,10K,5%,1/6W	911 151007YA	
RB23	REF-CF,10K,5%,1/6W	911 151007YA	
RB24	REF-MF,4.7M,5%,1/4W	911 474707DA	
RB25	REF-CF,220,5%,1/6W	911 132207YA	
RB26	REF-CF,5.1K,5%,1/6W	911 145107YA	
RB27	REF-CF,6.8K,5%,1/6W	911 146807YA	
RB32	REF-CF,4.7K,5%,1/6W	911 144707YA	
RB34	REF-CF,4.7K,5%,1/6W	911 144707YA	
RB39	REF-CF,1K,5%,1/6W	911 141007YA	
RB42	REF-CF,120,5%,1/6W	911 131207YA	
RB55	REF-CF,100,5%,1/6W	911 131007YA	
RB56	REF-CF,100,5%,1/6W	911 131007YA	
RG14	REF-CF,390,5%,1/6W	911 133907YA	
RG28	REF-CF,270K,5%,1/6W	911 162707YA	
RG29	REF-CF,1M,5%,1/6W	911 171007YA	
RG12	REF-CF,3.3K,5%,1/6W	911 143307YA	
RG13	REF-CF,22K,5%,1/6W	911 152207YA	
RG15	REF-CF,33,5%,1/6W	911 123307YA	
RG16	REF-CF,270,5%,1/2W(S)	911 132707FF	
RG17	REF-CF,75,5%,1/6W	911 127507YA	
RG19	REF-CF,15,5%,1/6W	911 121507YA	
RG20	REF-CF,270K,5%,1/6W	911 162707YA	
RG21	REF-CF,270K,5%,1/4W	911 162707DA	
RG22	REF-CF,10K,5%,1/6W	911 151007YA	
RG23	REF-CF,10K,5%,1/6W	911 151007YA	

LOC. NO	DESCRIPTION	CODE NO.	REMARK
RG24	REF-MF,4.7M,5%,1/4W	911 474707DA	
RG25	REF-CF,220,5%,1/6W	911 132207YA	
RG26	REF-CF,5.1K,5%,1/6W	911 145107YA	
RG27	REF-CF,6.8K,5%,1/6W	911 146807YA	
RG32	REF-CF,4.7K,5%,1/6W	911 144707YA	
RG34	REF-CF,4.7K,5%,1/6W	911 144707YA	
RG39	REF-CF,1K,5%,1/6W	911 141007YA	
RG42	REF-CF,120,5%,1/6W	911 131207YA	
RG55	REF-CF,100,5%,1/6W	911 131007YA	
RG56	REF-CF,100,5%,1/6W	911 131007YA	
RL101	RELAY-MINIATURE,12V	927 300023AB	
RL102	RELAY-MINIATURE,12V	927 300025AB	
RR14	REF-CF,390,5%,1/6W	911 133907YA	
RR28	REF-CF,270K,5%,1/6W	911 162707YA	
RR29	REF-CF,1M,5%,1/6W	911 171007YA	
RR12	REF-CF,1.8K,5%,1/6W	911 141807YA	
RR13	REF-CF,15K,5%,1/6W	911 151507YA	
RR15	REF-CF,33,5%,1/6W	911 123307YA	
RR16	REF-CF,270,5%,1/2W(S)	911 132707FF	
RR17	REF-CF,75,5%,1/6W	911 127507YA	
RR19	REF-CF,15,5%,1/6W	911 121507YA	
RR20	REF-CF,270K,5%,1/6W	911 162707YA	
RR21	REF-CF,270K,5%,1/4W	911 162707DA	
RR22	REF-CF,10K,5%,1/6W	911 151007YA	
RR23	REF-CF,10K,5%,1/6W	911 151007YA	
RR24	REF-MF,4.7M,5%,1/4W	911 474707DA	
RR25	REF-CF,220,5%,1/6W	911 132207YA	
RR26	REF-CF,5.1K,5%,1/6W	911 145107YA	
RR27	REF-CF,6.8K,5%,1/6W	911 146807YA	
RR32	REF-CF,4.7K,5%,1/6W	911 144707YA	
RR34	REF-CF,4.7K,5%,1/6W	911 144707YA	
RR39	REF-CF,1K,5%,1/6W	911 141007YA	
RR42	REF-CF,120,5%,1/6W	911 131207YA	
RR55	REF-CF,100,5%,1/6W	911 131007YA	
RR56	REF-CF,100,5%,1/6W	911 131007YA	
	VRS		
VR3	RES-VAR,SF-ROUND,5KOHM	913 445009WA	
VRB1	RES-VAR,SF-ROUND,10KOHM	913 451009WA	
VRB2	RES-VAR,SF-ROUND,5KOHM	913 445009WA	
VRG1	RES-VAR,SF-ROUND,10KOHM	913 451009WA	
VRG2	RES-VAR,SF-ROUND,5KOHM	913 445009WA	

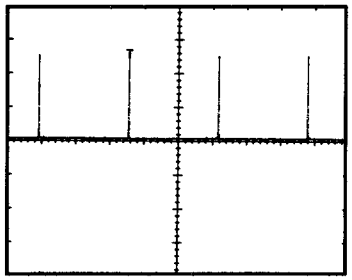
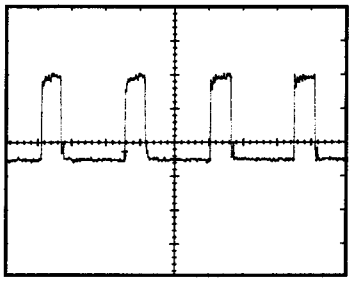
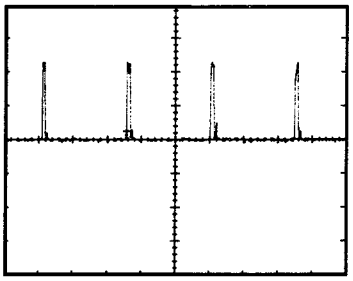
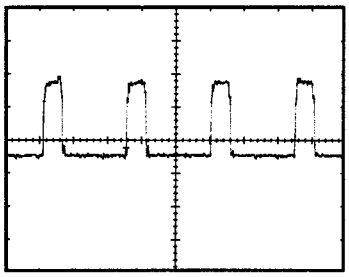
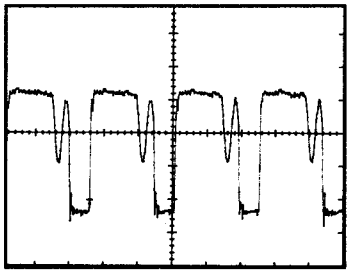
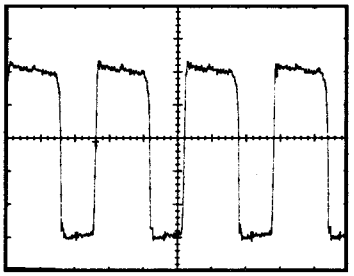
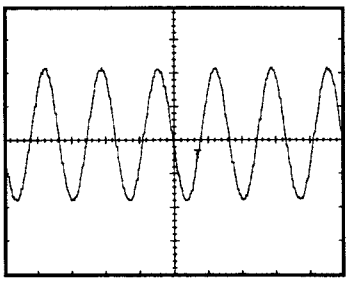
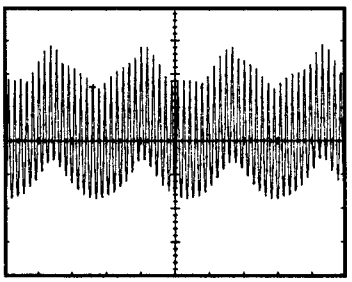
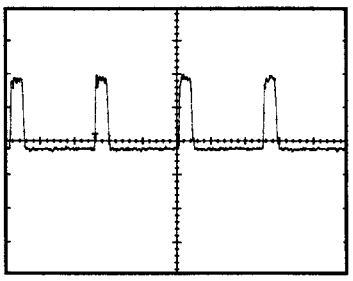
LOC. NO	DESCRIPTION	CODE NO.	REMARK
VRR1	RES-VAR,SF-ROUND,10KOHM	913 451009WA	
VRR2	RES-VAR,SF-ROUND,5KOHM	913 445009WA	
	OTHERS		
BNC-B	CON-JACK BNC:SER,SIL	935 620901AA	
BNC-G	CON-JACK BNC:SER,SIL	935 620901AA	
BNC-H/V	CON-JACK BNC:SER,SIL	935 620901AA	
BNC-R	CON-JACK BNC:SER,SIL	935 620901AA	
BNC-V	CON-JACK BNC:SER,SIL	935 620901AA	
D-SUB	CON-D-SUB,9P,RECEPTACLE	935 100209CB	
LF101	FILTER-LPF,EMI,LC,47PF	943 150021AG	
PCB	PCB-VIDEO, CFG963*,2LAYER	947 460041BA	
XTAL 2	C-RESO,3.58M,0.5%	941 210011TA	
CRT PCB			
	CAPACITORS		
C148	CAP-CERAMIC,103Z,2H,DISC	915 325100VZVH	
C149	CAP-CERAMIC,103Z,2H,DISC	915 325100VZVH	
C150	CAP-CERAMIC,103P,3D,Y5U	915 325100YPUX	
C151	CAP-CERAMIC,104Z,1H,Y5V	915 336100HZVH	
	CONNECTORS		
CN105	CON-WALL HEADER,4P,2.5MM	935 241304EA	
CN106	CON-WALL HEADER,4P,2.5MM	935 241304EA	
	RESISTORS		
R165	REF-MO,1.2,5%,3W(T)	911 311207LFXA	
R166	REF-MO,1.2,5%,3W(T)	911 311207LFXA	
RB45	REF-CC,39,10%,1/2W	911 223908FA	
RB50	REF-CF,680,5%,1/4W	911 136807DA	
RG45	REF-CC,39,10%,1/2W	911 223908FA	
RG50	REF-CF,680,5%,1/4W	911 136807DA	
RR45	REF-CC,39,10%,1/2W	911 223908FA	
RR50	REF-CF,680,5%,1/4W	911 136807DA	
	OTHERS		
CRT-SOCKET	PIN-GT:14.2MM 2.35PI	03124-700-810	
LB50	INDUCTOR-AXIAL,0.47UH	925 001001AU	

LOC. NO	DESCRIPTION	CODE NO.	REMARK
LG50	INDUCTOR-AXIAL,0.47UH	925 001001AU	
LR50	INDUCTOR-AXIAL,0.47UH	925 001001AU	
PCB	PCB-CRT, CFG963*, 1LAYER	947 460041CA	
R165	PIN-GT:14.2MM 2.35PI	03124-700-810	
R166	PIN-GT:14.2MM 2.35PI	03124-700-810	
SG101	SPARK GAP:DSP-301N	04569-002-210	
SGB1	SPARK GAP:DSP-301N	04569-002-210	
SGG1	SPARK GAP:DSP-301N	04569-002-210	
SGR1	SPARK GAP:DSP-301N	04569-002-210	
SOCKET	CON-JACK CRT SOCKET	935 720901JB	

WAVEFORMS

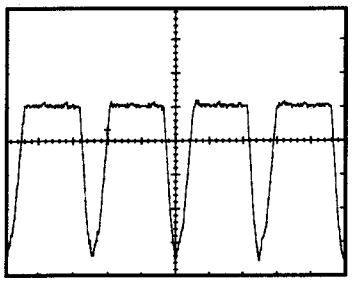
CH2 2V A 5 ms 703 mV VERT  CH2 P-P = 3.6800 V CH2 RMS = 1.0200 V	CH2 20V A 5 ms 28.3 V VERT  CH2 P-P = 51.2 V CH2 RMS = 7.7816 V	CH2 10 V A 5 ms -9.06 V VERT  CH2 P-P = 23.6 V CH2 RMS = 3.8949 V
(1) 3.68 Vp-p (CN302 PIN 2)	(2) 51.2 Vp-p (CN302 PIN 1)	(3) 23.6 Vp-p (CN13 PIN 2)
CH2 2 V A 5 ms -4.97 V VERT  CH2 P-P = 12.640 V CH2 RMS = 1.4811 V	CH2 1V A 5 ms 262 mV VERT  CH2 P-P = 3.9600 V CH2 RMS = 1.1381 V	CH2 2 V A 5 μs -539 mV VERT  CH2 P-P = 4.16 V CH2 RMS = 1.4979 V
(4) 12.64 Vp-p (Q301 Collector)	(5) 3.96 Vp-p (IC302 PIN 15)	(6) 4.16Vp-p (QR2 EMITER)
CH2 2 V A 5 μs -1.93 V VERT  CH2 P-P = 5.28 V CH2 RMS = 1.2003 V	CH2 2 V A 5 μs -688 mV VERT  CH2 P-P = 5.36 V CH2 RMS = 1.8771 V	CH2 2 V A 5 μs -1.32 V VERT  CH2 P-P = 5.36 V CH2 RMS = 1.8938 V
(7) 5.28 Vp-p (IC101 PIN 14)	(8) 5.36 Vp-p (IC101 PIN 13)	(9) 5.36 Vp-p (CN103 PIN 5)

WAVEFORMS

CH2 2 V A 5 ms 2.19 V VERT  CH2 P-P = 4.96 V CH2 RMS = 519.00 mV	CH2 2 V A 5 μs 23.4 mV VERT  CH2 P-P = 5.28 V CH2 RMS = 2.0726 V	CH2 2 V A 5 μs 2.24 V VERT  CH2 P-P = 5.28 V CH2 RMS = 992.21 mV
(10) 4.96Vp-p (IC110 PIN 14)	(11) 5.28 Vp-p (IC110 PIN 15)	(12) 5.28 Vp-p (IC110 PIN 16)
CH2 20 V A 5 μs 21.5 V VERT  CH2 P-P = 49.6 V CH2 RMS = 18.223 V	CH2 100 V A 5 μs -155 V VERT  CH2 P-P = 432 V CH2 RMS = 150.02 V	CH2 5 V A 10 μs 732 mV VERT  CH2 P-P = 27.2 V CH2 RMS = 11.859 V
(13) 49.6 Vp-p (CN10 PIN 1)	(14) 432 Vp-p (T601 PIN 11)	(15) 27.2 Vp-p (T603 PIN 3)
CH2 1 V A 50 ns 164 mV VERT  CH2 P-P = 4.0000 V CH2 RMS = 1.3910 V CH2 FREQ = 12.048 MHz	CH2 100 V A 5 ms -170 V VERT  CH2 P-P = 464 V CH2 RMS = 124.24 V	CH2 100 V A 5 μs 58.6 V VERT  CH2 P-P = 232 V CH2 RMS = 72.762 V
(16) 4.0 Vp-p (IC201 PIN 18)	(17) 464 Vp-p (C472 FOCUS)	(18) 232 Vp-p (T503 PIN 5)

WAVEFORMS

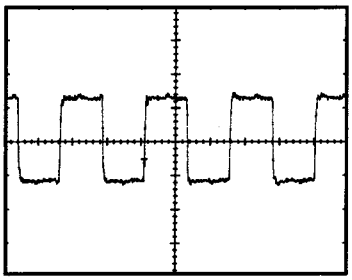
CH2 200 V A 5 μs 0.0 V VERT



CH2 P-P = 952 V
CH2 RMS = 303.03 V

(19) 952 Vp-p (T503 PIN 10)

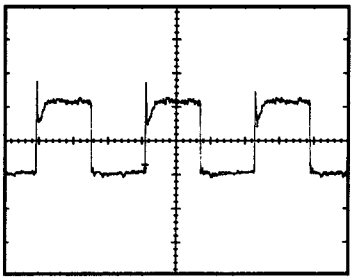
CH2 5 V A 5 μs -117 mV VERT



CH2 P-P = 13.6 V
CH2 RMS = 6.0856 V

(20) 13.6 Vp-p (IC503 GATE)

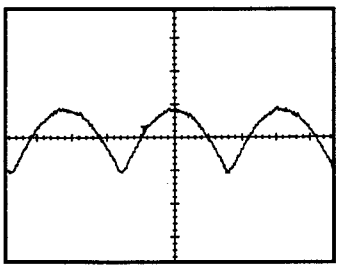
CH2 10 V A 10 μs -117 mV VERT



CH2 P-P = 28.4 V
CH2 RMS = 10.434 V

(21) 28.4 Vp-p (Q503 DRAIN)

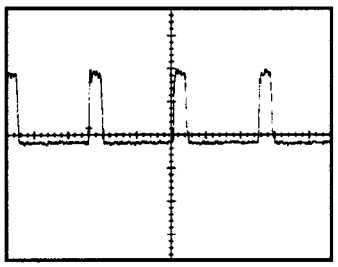
CH2 10V A 10 μs 0.0 V VERT



CH2 P-P = 20.0 V
CH2 RMS = 6.0405 V

(22) 20.0 Vp-p (T403 PIN 3)

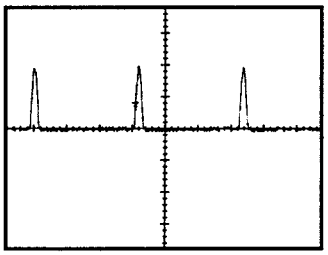
CH2 100 V A 10 μs 66.4 V VERT



CH2 P-P = 232 V
CH2 RMS = 90.365 V

(23) 232 Vp-p (T404 PIN 2)

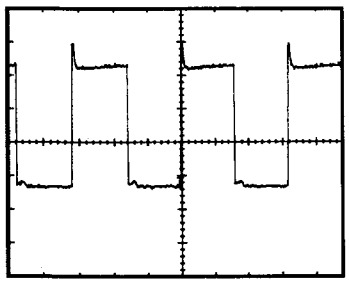
CH2 500 V A 10 μs 232 V VERT



CH2 P-P = 1.04 kV
CH2 RMS = 196.92 V

(24) 1.04k Vp-p (T402 PIN 2)

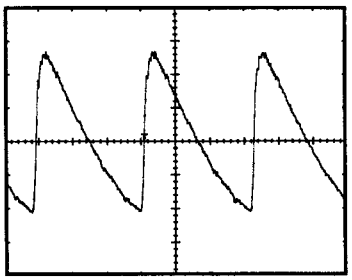
CH2 10 V A 10 μs 1.17 V VERT



CH2 P-P = 44.0 V
CH2 RMS = 18.213 V

(25) 44.0 Vp-p (T401 PIN 8)

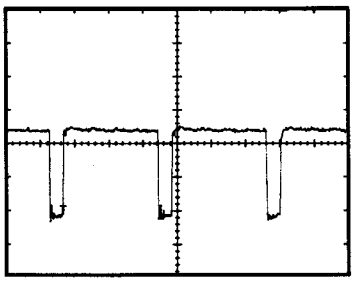
CH2 2 V A 10 μs 93.8 mV VERT



CH2 P-P = 9.60 V
CH2 RMS = 3.0402 V

(26) 9.60 Vp-p (T403 PIN 5)

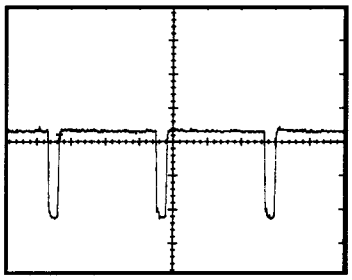
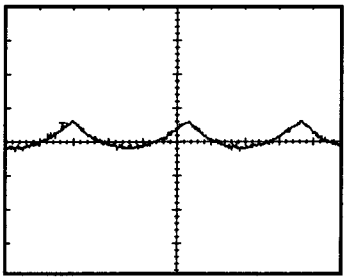
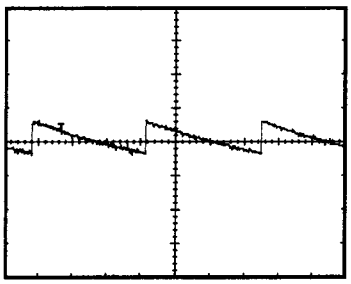
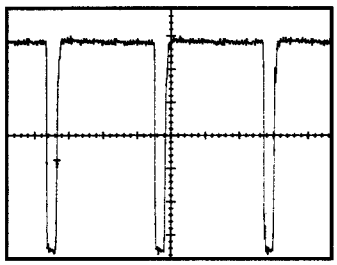
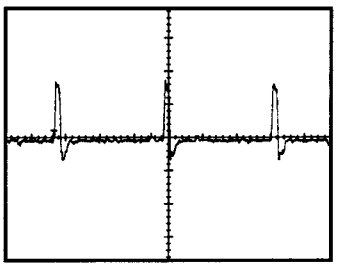
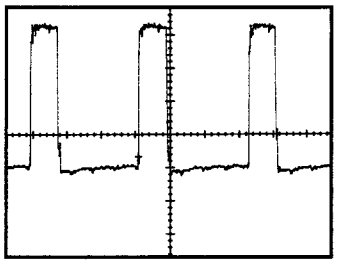
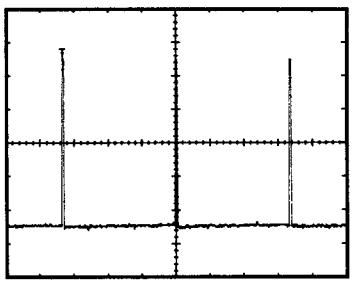
CH2 5V A 10 μs -4.88 V VERT



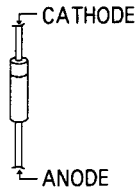
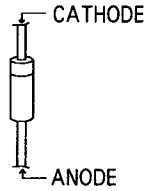
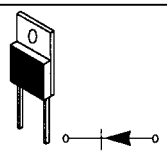
CH2 P-P = 14.2 V
CH2 RMS = 4.2665 V

(27) 14.2 Vp-p (IC403 PIN 14)

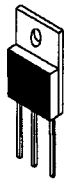
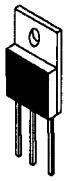
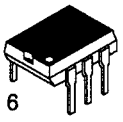
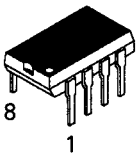
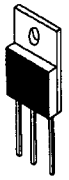
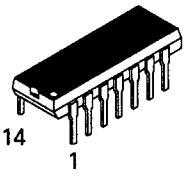
WAVEFORMS

CH2 5 V A 10 μs 19.5 mV VERT  CH2 P-P = 13.6 V CH2 RMS = 3.7576 V	CH2 1 V A 5 ms 281 mV VERT  CH2 P-P = 920 mV CH2 RMS = 238.18 mV	CH2 1 V A 5 ms 281 mV VERT  CH2 P-P = 1.08 V CH2 RMS = 275.09 mV
(28) 13.6 Vp-p (IC403 PIN 3)	(29) 920 mVp-p (IC701 PIN 4)	(30) 1.08 Vp-p (IC701 PIN 1)
CH2 2 V A 10 μs 31.3 mV VERT  CH2 P-P = 13.2 V CH2 RMS = 3.7047 V	CH2 1 V A 10 μs 46.9 mV VERT  CH2 P-P = 2.44 V CH2 RMS = 348.75 mV	CH2 5 V A 10 μs 1.76 V VERT  CH1 P-P = 23.4 V CH1 RMS = 9.1736 V
(31) 13.2 Vp-p (Q407 Collector)	(32) 2.44 Vp-p (IC701 PIN 8)	(33) 23.4 Vp-p (IC405 PIN 6)
CH2 2 V A 5 mv 2.34 V VERT  CH1 P-P = 10.6 V CH1 RMS = 1.3141 V		
(34) 10.6 Vp-p (Q423 Collector)		

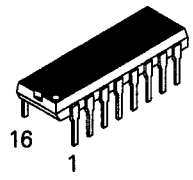
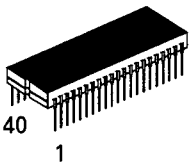
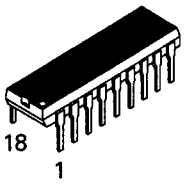
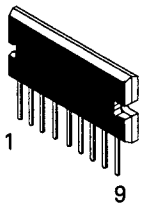
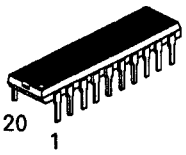
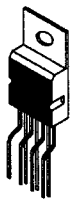
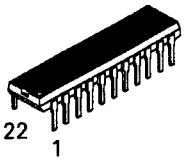
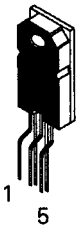
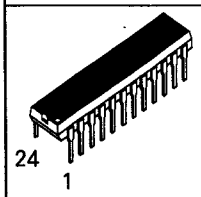
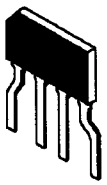
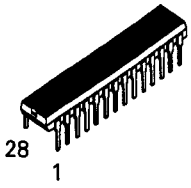
SEMICONDUCTOR LEAD IDENTIFICATION

PARTS	TYPE NO.	REF. NO.	PARTS	TYPE NO.	REF. NO.
	1N4148	D201,D202,D203, D204,D205,D207, D208,D209,D403, D404,D405,D406, D407,D408,D409, D411,D412,D413, D421,D422,D423, D424,D425,D426, D428,D429,D501, D502,D503,D511, D516,D517,D518, D520,D522,D524, D605,D606,D607, D611,D618,D619, D103,D112.D117, D302,D303,D304, D305,DB1,DB2 DB21,DB22,DB23, DB3,DB5,DG1, DG2,DG21,DG22, DG23,DG3,DG5, DR1,DR2,DR21, DR22,DR23,DR3, DR5		REC, UF5404	D402,D609,D612, D613,D614,D615, D617,D623
				REC,UF4004	D414,D509,D621
				REC, UF4001	D418,D512,D513,
				REC, UF4007	D604
				REC, 1N4001	D415,D416,D427, D504,D505,D519, D525,D526,D301
				REC,1N4937	D419,D420
				REC,RGP02-12	D508,D610
				REC,KBL06	D601
				1N4007	D602,D101,D102
				REC,1R5GU41	D616,D622
				1N4002	D620
	ZEN, UZ-12BM	D206,D401		MUR10150E	D417
	ZEN, RD47EB	D400		HUR10120E	D506,D523
	ZEN, UZ-5.1B	ZD201,ZD202, ZD203,ZD401, D106,D108,D110, D116		KSC945	Q202,Q406,Q423, Q424,Q425,Q507, Q508,Q509,Q510, Q607,Q608,Q702, Q103,Q106,Q107, Q301,Q302
	ZEN, ZPD18	ZD501			
	ZEN, ZPD2.7	ZD502,D160		MPS2369	Q203,Q204,Q108
	ZEN, UZ-15BM	ZD503		KSP2222A	Q403,Q407,Q502
	BAV Z1	DB6,DB7,DG6, DG7,DR6,DR7		2N3904	Q104,Q110,Q304, Q408

SEMICONDUCTOR LEAD IDENTIFICATION

PARTS	TYPE NO.	REF. NO.	PARTS	TYPE NO.	REF. NO.
E B C	KSC1008	Q102 Q414,Q420,Q605	 G D S	IRF740	Q411,Q405
	2SC3675	Q421		IRF640	Q415,Q416,Q417, Q418,Q419
	MPS3646	Q105,Q422			
	2N5770	QR2,QG2,QB2	 I G O	7812 7805 7824	IC107 IC108 IC303
	KSP42	QR3,QG3,QB3			
	MPS2907	Q401,Q514			
	KSA733	Q409,Q501,Q511, Q512,Q609,Q303	G D S	2SK1358	Q604
	2N3906	Q101			
S G D	VN2222LL	Q404,Q405			
	VN0606M	Q410,Q412,Q503	 6 1	TRCQY80NG	IC603,IC606
R A K	S431 REGULATOR	IC115,IC406,IC502, IC604			
	7045 REGULATOR	IC206	 8 1	EEPROM,93C66 3842 358, OPAMP	IC202 IC602,IC405 IC401,IC407
 B C E	MJW16212	Q504,Q413	 14 1	LM319 74HC125	IC109 IC111

SEMICONDUCTOR LEAD IDENTIFICATION

PARTS	TYPE NO.	REF. NO.	PARTS	TYPE NO.	REF. NO.
	74HC221 14068 DL494 141540 324,OPAMP	IC402 IC403 IC501 IC105 IC701,IC103		8752 MICRO COMPUTER	IC201
	144110	IC106		VPA12	ICR01,ICG01, ICB01
	9102	IC302		8138A 8172	IC204 IC301
	62358 14066	IC203 IC404,IC702		STR81145A STR17006	IC601 IC605
	SL506	IC110		KBL06	D601
	LM1205N	IC101			